REPORT RESUMES

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PERSONAL AND FAMILY SURVIVAL, CIVIL DEFENSE ADULT EDUCATION.

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TEN BASIC LESSON PLANS THAT CAN BE ADAPTED TO SUIT THE NEEDS OF THE STUDENTS AND EXPANDED TO FIT LOCAL SITUATIONS SERVE AS A GUIDE TO CIVIL DEFENSE ADULT EDUCATION TEACHERS AND REPRESENT THE STATE OF CIVIL DEFENSE AS OF PUBLICATION DATE. THE LESSONS ARE DESIGNED TO BE USED WITH SLIDES OR FILMSTRIPS, A MINIATURE ILLUSTRATION OF WHICH APPEARS AT THE APPROPRIATE PLACE IN THE UNIT. TOPICS COVERED ARE THE COURSE INTRODUCTION, MODERN WEAPONS AND RADIOACTIVE FALLOUT (EFFECTS AND PROTECTION), NATIONAL CIVIL DEFENSE PROGRAM, NATIONAL SHELTER PROGRAM (HOME AND COMMUNITY SHELTERS), LOCAL CIVIL DEFENSE AND COMMUNITY SHELTER PLANS, SURVIVAL ON THE FARM, INDIVIDUAL AND FAMILY PREPAREDNESS FOR SHELTER LIVING, AND EMERGENCE FROM SHELTERS. A LIST OF LESSON OBJECTIVES, REFERENCES, AND TRAINING AIDS ACCOMPANIES EACH LESSON PLAN. THERE IS AN OUTLINE FOR FAMILY EMERGENCY PLANNING AND A SUGGESTED OUTLINE FOR PRESENTATION OF LOCAL CIVIL DEFENSE PROGRAMS. (AJ)

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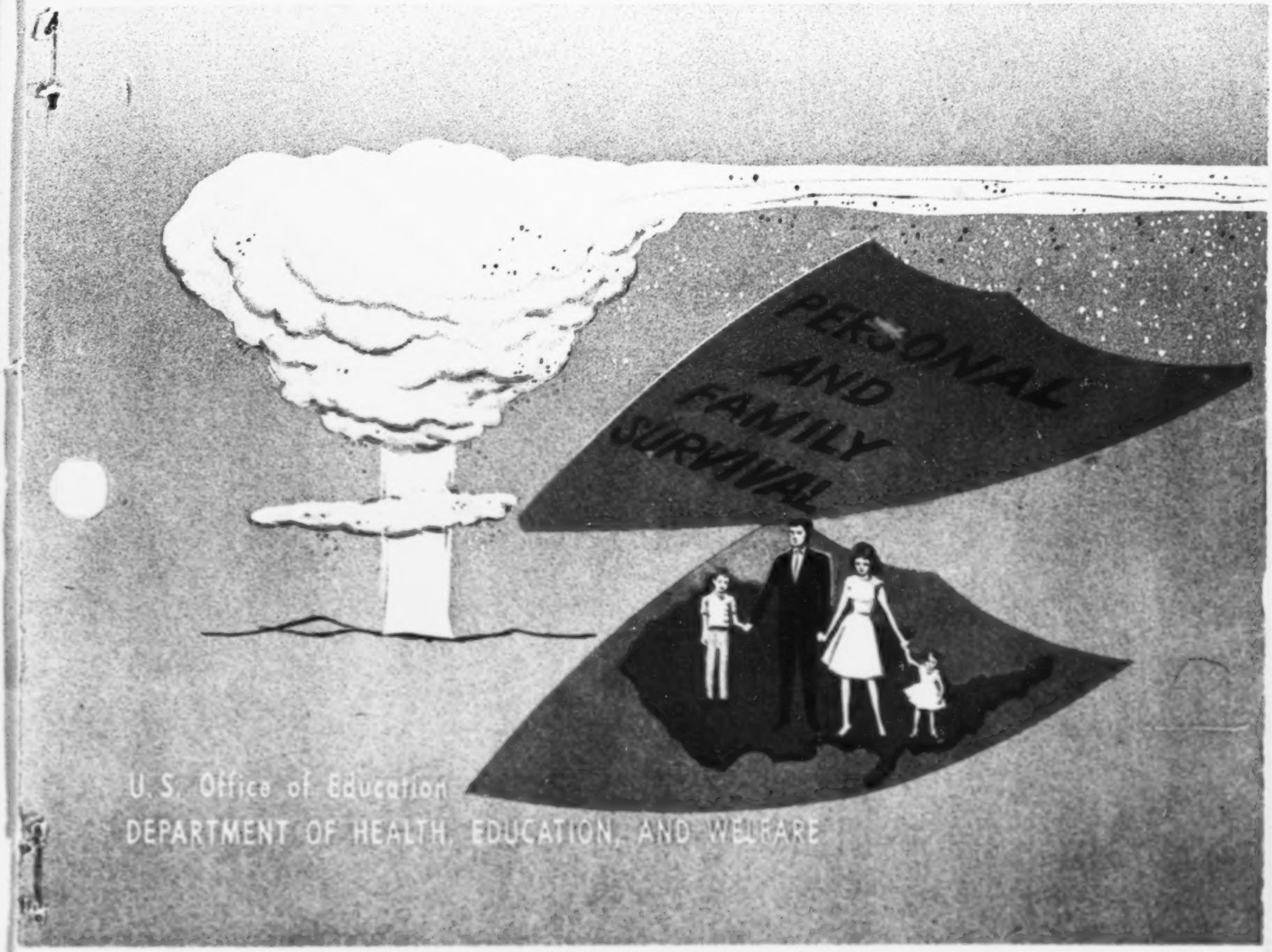
TEACHERS MANUAL
Civil Defense Adult Education


PERSONAL AND FAMILY SURVIVAL

U.S. Office of Education
DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

March 1966

AC 001 271

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Civil Defense Adult Education

PERSONAL AND FAMILY SURVIVAL

Table of Contents

Lesson No.	Title	Page No.
I.	Course Introduction	1
II.	Modern Weapons and Radioactive Fallout (Effects)	5
III.	Modern Weapons and Radioactive Fallout (Protection)	17
IV.	National Civil Defense Program	29
V.	National Shelter Program (Community Shelters)	45
VI.	National Shelter Program (Home Shelters)	59
VII.	Local Civil Defense and Community Shelter Plans	71
VIII.	Survival on the Farm	81
IX.	Individual and Family Preparedness for Shelter Living	93
X.	Emergence from Shelters	103

PREFACE

This Teachers Manual has been prepared as an aid to the instructor in presenting the Civil Defense Adult Education Course - Personal and Family Survival and represents Civil Defense as of the date of publication. The Civil Defense Adult Education Program is administered by State Departments of Education with funds provided through contracts with the U.S. Office of Education, U.S. Department of Health, Education, and Welfare.

This publication contains ten lesson plans to guide the instructor in presenting the course. The lesson plans should not be read verbatim to students. Instructors should add pertinent information to clarify concepts and to adapt the text to the needs of students. Additional information is contained in the references listed in the lesson plans. The length of time to be spent on each lesson will vary depending on the needs of the class. For example, in rural areas instructors will spend more time on the lessons "Home Shelters" and "Survival on the Farm" than would be spent in urban areas.

State CDAE Coordinators will make available to instructors a set of visuals to be used in the course. Instructors may request these in either slide or filmstrip form. The visuals are designed for use in lessons 2, 3, 4, 5, 6, 8, and 10. A miniature illustration of the visual appears on the left side of the lesson plan at the appropriate place where it should be used in the unit.

Only those films approved by the U.S. Office of Education should be used in the course. As new films are developed, State Coordinators will make their availability known to teachers. Suggestions will also be given as to the most appropriate lesson in which the film may be used.

Information on how to obtain special equipment and materials such as survey meters, radioactive isotopes, and survival crackers will be furnished by the State CDAE Coordinator.

LESSON PLAN NO. I

LESSON TITLE: Course Introduction

OBJECTIVES:

1. To give class members information on administrative matters and general course requirements.
2. To give class members a brief description of the course, its purpose, objectives, scope, and content.

REFERENCES:

None

REQUIREMENTS FOR INSTRUCTOR:

1. Film - Knowledge is Protection
2. 16 mm motion picture projector and screen
3. Copies of pre course quiz
4. Handout materials as prescribed by State CDAE Coordinator

A. General
   1. Welcome and greet class.
   2. Introduce self and tell something of your background.
   3. Introduce any guests who might be present.
   4. Have students introduce themselves, and if appropriate, tell something of their background.

B. Administrative Matters

   Discuss as appropriate the following administrative matters.
   1. Class Schedule
   2. Attendance
   3. Handout material

C. Course Objectives

   The purpose of this course is to help save lives if a nuclear attack should ever come to America.
   1. By providing technical background and an understanding

of the effects of nuclear weapons.

2. By describing protective measures an individual might take to minimize the effects of nuclear weapons.
3. By outlining the Civil Defense program and plans the Federal, State, and local governments have developed to minimize the loss of lives.
4. By making individuals and their families aware of the planning they should do to cope effectively with nuclear and natural disasters.

NOTE: Emphasize how community and family survival planning did or might have saved lives or minimized property loss in natural disasters that have occurred in that community.

D. Pre Course Quiz

In many classroom situations instructors will find it desirable to administer a pre course quiz during the opening session of the course. The quiz can serve many purposes:

1. It can serve as a means of identifying many misconceptions about the nuclear age.
2. It can serve as a means of motivating students and arousing their interest in the course.
3. It can assist in setting the stage for student discussion and participation in class sessions.
4. It can serve as a means of presenting an overview of the course. Should a quiz be used, care must be taken not to threaten or frighten students. Students should be told the purpose of the exercise and that their scores at this time are unimportant. State CDAE Coordinators may wish to furnish sample quizzes or will assist instructors who wish to develop their own.

E. Scope and Content of Course

1. Show movie, Knowledge is Protection, to introduce course content.
2. Describe briefly each lesson on schedule.

Modern Weapons and Radioactive Fallout (Effects)

This lesson describes the destructive effects of nuclear weapons. These are blast, heat, and nuclear radiation. Each of these is dealt with as a threat to human survival. The effects of nuclear radiation on the human body are emphasized.

Modern Weapons and Radioactive Fallout (Protection)
In this lesson, principles of protection against nuclear radiation are discussed. The principles are time, distance, and shielding. Application of these principles is presented as a basis of the National Civil Defense Program.

The National Civil Defense Program
The National Civil Defense Program is discussed as an integral part of the damage limitation structure of this Nation's strategic defense system. An overview of civil defense efforts at the national level is presented. This includes a discussion of essential elements of the program such as shelter, warning, emergency communications, radiological monitoring, training and military support of civil defense.

National Fallout Shelter Program (Community Shelters)
This lesson highlights the surveying, marking, and provisioning of community fallout shelters. Shelter management, shelter organization and shelter living are discussed. Students will be familiarized with what life would be like in community shelters should this Nation be subjected to a nuclear attack.

National Fallout Shelter Program (Home Shelters)
A discussion of the need, types and descriptions of home shelters is presented. Supplies necessary for a home shelter are outlined and last minute shelter expediencies are pointed out.

Local Civil Defense and Community Shelter Plans
In this lesson information is provided on local civil defense activities, local civil defense organization, and community shelter planning. Progress of the National Fallout Shelter Program in that community will be discussed and class members will be made aware of their responsibilities in support of local civil defense plans.

Survival on the Farm
Problems of survival on the farm are in many ways more complex than those faced by an urban dweller. This

lesson deals with the farmer's special problems, the effects of radioactive fallout on livestock, and the effects of radiation on farm crops. This unit is also of interest to urban dwellers for it points out how food production would be resumed following a nuclear attack.

Individual and Family Preparedness for Shelter Living
In this lesson information is furnished to assist students in the development of a family survival plan. Students will be furnished a guide to family survival planning and will be urged to discuss with their families the things that each should know, do and have for survival.

Emergence from Shelters
This lesson deals with the precautionary and protective measures that should be taken upon emergence from shelter. National, State, and local plans for recovery and rehabilitation are also discussed.

3. Instructors may wish to reproduce an outline of the course and hand them out at this time.
4. Mention movies to be shown, field trips, guest speakers, etc.

F. Introduce lesson to follow.

LESSON PLAN NO. II

Modern Weapons and
Radioactive Fallout (Effects)

V-1

LESSON TITLE: Modern Weapons and Radioactive Fallout (Effects)

OBJECTIVE:

To develop an understanding of the blast, thermal and radiation effects of nuclear weapons.

REFERENCES:

Personal and Family Survival, SM-3-11 (Revised)
The Effects of Nuclear Weapons, Glasstone Revised Edition, February 1964

TRAINING AIDS:

1. Visual Set - Personal and Family Survival, Frames 1-28
2. Projector and screen
3. 16mm film projector
4. Film: Operation Cue

A. Introduction

Both the military forces and the civilian population of the United States may be endangered by the effects of modern weapons. The purpose of this lesson is to explain the basic effects of nuclear weapons. An understanding of thermal radiation, blast, and nuclear radiation is necessary before proper protective actions can be developed against them.

B. Comparison of Conventional and Nuclear Weapons

V-2

1. Conventional weapons are those which depend on TNT or similar non-nuclear explosives. When a conventional high-explosive weapon is detonated, the sudden release of energy causes a considerable increase in temperature and pressure. Explosive materials are converted into hot, compressed gases. Since these gases are at very high temperature and pressures, they expand rapidly and, thus, initiate a pressure wave, called a blast wave, in the surrounding air, water, or earth. It is this blast wave that causes most of the damage.

V-3

2. Nuclear weapons are similar to those of conventional types insofar as there is destructive action due to blast.

V-4

3. There are several basic differences between nuclear and high-explosive weapons.

a. First, nuclear explosions can be many thousands (or millions) of times more powerful than the largest conventional detonations.

b. Second, the amount of heat emitted as thermal radiation is vastly greater than in conventional weapons and affects larger areas. Even at considerable distances it is capable of causing skin burns and of starting fires.

c. Finally, the nuclear detonation, unlike conventional explosions, results in the formation of radioactive particles. Some of these particles emit highly penetrating rays which are capable of inflicting widespread and serious bodily damage over an extended period of time.

4. Preparation for defense against nuclear attack is more than adequate for defense against conventional weapons; the converse is not true.

C. Destructive Capabilities

1. Nuclear weapons have much greater destructive capability than conventional weapons.

V-5

2. The weapon used in the Hiroshima raid was small when compared to the thermo-nuclear weapons of today. However, it may be used to illustrate the tremendous destructive power of a nuclear weapon.

Hamburg, Germany	Hiroshima, Japan
8 days bombing	1 plane
8800 tons HE and Incendiaries	1 bomb
6400 acres burned and blasted	1 city
60,000 killed	70,000 killed

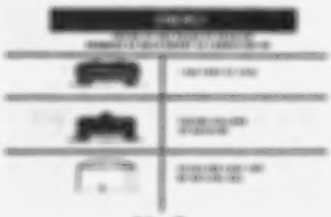
V-6

NOTE: Explain the explosive power of a nuclear explosion as measured in terms of equivalent tons of TNT.

1 KT (kiloton) = 1,000 tons of TNT
1 Mt (megaton) - 1,000,000 tons of TNT

V-7

3. It is difficult to perceive the magnitude of the energy released in the detonation of a thermo-nuclear weapon. To illustrate this, assume that 100 bombers carry 10 tons each of high explosives over a target each day. It would require 55 years to deliver the equivalent of a 20 megaton nuclear weapon.



V-8

4. The energy resulting from the fission of one pound of uranium equals as much as the combustion of 1,400 tons of coal, 250,000 gallons of gasoline, or 40,000,000 cubic feet of natural gas.

D. Energy Distribution

V-9

1. About 50% of the total energy from a typical nuclear air burst detonated near the earth appears as blast waves or ground shock.

2. Thermal radiation accounts for about 35% of the total energy. This presents itself in the form of light and heat.

3. About 5% of the energy appears as initial nuclear radiation. This is the gamma radiation and neutrons that are emitted within the first minute after detonation.

4. Residual nuclear radiation accounts for the remaining 10% of the energy.

This 10% consists of the nuclear radiation that is emitted from radioactive materials remaining after the first minute from the time of detonation. Although this represents only a small percentage of the total energy, it is highly significant. It poses a threat over large areas for an extended period of time. Yet, it is a hazard against which protection can be provided.

E. Types of Bursts

V-10

An enemy might use nuclear weapons in various ways depending on the results he seeks. Among other things he will consider the types of burst--sub-surface, surface, air or high altitude.

1. If the center of a nuclear explosion is beneath the ground or under water, it is described as a sub-surface burst. There is less blast and thermal damage from

this type of detonation than there is from an air or surface burst. However, shock damage near the point of detonation is more severe than with other types of bursts. A sub-surface burst is more effective in destroying hardened (underground) targets. If the burst is near the surface so that the fireball actually breaks through, fallout is generated.

2. In a surface burst, the fireball touches the earth's surface. The thermal and blast damage areas are greater than those of a subsurface burst but smaller than those of an equivalent air burst. Great quantities of fallout are generated.

3. An air burst is a detonation in which the weapon is exploded at such an altitude that the fireball does not touch the ground. This type of burst produces the largest thermal and blast damage area. Little fallout is produced.

4. A detonation that occurs 100,000 feet or more above the surface of the earth is called a high altitude burst. It causes little or no blast or thermal damage to surface structures. It may temporarily disrupt communications as well as cause eye damage to persons looking at the flash. There is little or no fallout hazard.

F. Effects of the Explosion

V-11

The effects of the explosion and extent of damage will be determined primarily by the size of the weapon and type of burst.

1. The point directly beneath the center of a nuclear explosion is called ground zero.

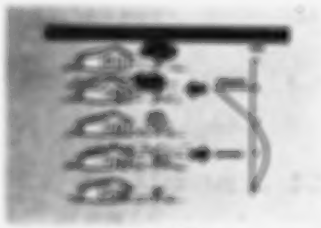
2. The surrounding land, objects, and persons would suffer varying degrees of damage depending on their distance

from ground zero and the size of the weapon.

3. From a 5 megaton surface burst the following ranges of damage may be expected.
    a. A circular area surrounding ground zero with a radius of approximately 3 miles where there would be almost complete destruction.
    b. From three to five miles from ground zero there would be heavy damage. Buildings in these areas would be damaged beyond repair by blast and fire.
    c. Between five and seven miles from the point of detonation buildings would be moderately damaged. Most would be repairable.
    d. An area sustaining light damage would extend from about seven to nine miles from ground zero. In this area most buildings would remain intact. However, fires, flying glass and other debris would be a problem.

G. Blast Effects

A fraction of a second after a nuclear weapon explosion, the expanding gases would cause the development of a high pressure wave which would move outward from the fireball at about the speed of sound (1/5 of a mile per second).


V-12

1. For a short interval after the detonation there would be no increase in pressure since it would take the blast wave some time to travel from the point of explosion to a given location. Point 1 represents the time of the explosion.

2. Point 2 represents the time of arrival of the shock front. Here a strong wind would blow away from the explosion. Its velocity would decrease rapidly with time.

3. At Point 3 the pressure has fallen to normal.

4. As the pressure in the blast wave continues to decrease, it sinks below that of the surrounding atmosphere. Point 4 illustrates the negative or suction phase passing the location. Wind now would

blow in the opposite direction or toward the explosion. However, less damage occurs in this phase than during the positive phase.

5. At Point 5 the direct destructive effects of the blast are over.

H. Thermal Effects

1. Thermal radiation travels with the speed of light--186,000 miles per second. Hence, it reaches all points around the blast area much earlier than does the blast wave itself. In some ways thermal radiation resembles heat and light coming from the sun.

2. The thermal effects of a nuclear weapon can produce burns and set fires in areas beyond those affected by blast and shock.

V-13

3. From a 5 megaton ground burst the following effects on exposed skin might be expected.
   a. First degree burns - 11 to 16 miles
   b. Second degree burns - 10 to 11½ miles
   c. Third degree burns - up to 10 miles

I. Nuclear Radiation

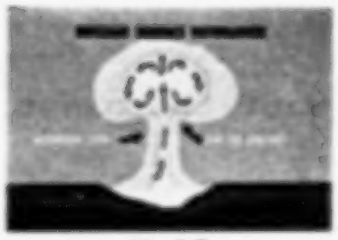
Nuclear Radiation is emitted as either initial or residual.

V-14

1. Initial radiation is radiation emitted during the first minute after a nuclear detonation. It consists of gamma rays and neutrons. Because the area of severe damage from blast and fire effects extends to a far greater distance from ground zero than the area in which initial radiation can cause casualties, initial radiation does not present an additional survival problem.

2. While blast, fire, and initial radiation would cause widespread destruction, radioactive fallout could affect a much greater geographical area and threaten additional millions of people.

J. Fallout Formation



V-15

1. When a nuclear explosion occurs close to the ground, particles of earth and debris - amounting to thousands of tons of material are taken up into the fireball and rise in the mushroom cloud. These particles become fused or vaporized because of the extremely high temperature in the fireball. Later they become incorporated with the fission products and radioactive residues of the weapon. The particles gradually fall back on the earth as sources of radioactivity called FALLOUT.

V-16

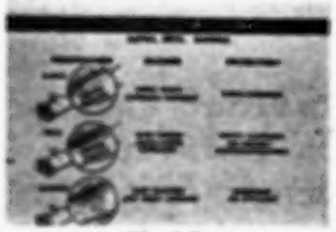
2. Radioactive debris - fallout - may be of many sizes. Particles the size of sand may be carried many miles from the point of explosion. Most fallout particles are visible but the nuclear radiation given off by them cannot be detected by the senses directly. Radiation cannot be seen, heard, smelled, felt, or tasted.

V-17

3. It takes time for fallout to drop from a nuclear cloud. The size of the particles is an important factor in determining the rate of their return to earth.
   a. Large particles fall faster, land closer and are more radioactive.
   b. Small particles fall more slowly and land farther away.
   c. Fallout distribution is determined primarily by high altitude winds that often blow in quite a different direction from ground winds.
   d. The height of the cloud will also influence where particles fall.
   e. The area of severe fallout might stretch 5 miles or more upwind of ground zero and 150 - 200 miles downwind depending on the strength of the wind and the bomb yield.

K. Types of Nuclear Radiation

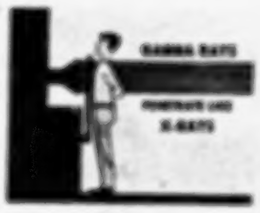
There are three types of nuclear radiation--Alpha, beta, and gamma.



V-18

1. Alpha particles travel only one to three inches in the air and cannot penetrate the the skin.

2. Beta particles may have an average range of 3 - 4 feet in the air. If fallout is allowed to remain on the skin, beta particles may cause burns, but cannot penetrate to internal organs. Clothing will keep beta particles off of the skin. Prompt removal of fallout from the skin can prevent skin damage.



V-19

3. Gamma rays are similar to X-rays and can penetrate considerable thicknesses. They can readily penetrate the body and damage internal body organs. They travel great distances and pose the greatest radiation threat. Only distance or shielding will provide protection from gamma radiation until time has caused it to decay.

L. Measuring Radiation

The roentgen (pronounced rent' gen) is the unit of measure for radiation. It is named after W. K. Roentgen, the discoverer of X-rays.

V-20

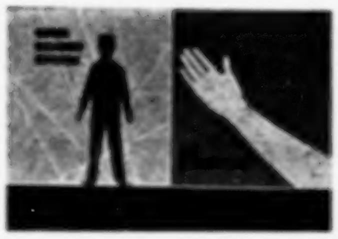
1. The term "dose" is often used in the sense of exposure dose expressed in roentgens. It indicates the total or accumulated amount of radiation one has received.

2. The term "dose rate" indicates the intensity of radiation to which one is exposed. It is expressed in amount per unit of time.

V-21

NOTE: Compare the measuring of "dose rate" to the speedometer of an automobile and "dose"to the odometer.

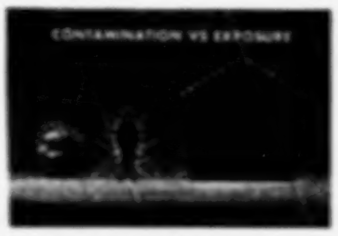
M. Biomedical Aspects of Radiation



V-22

1. The immediate hazards from fallout radia- are primarily wholebody gamma radiation exposure and possible skin contamination.

2. Injury from wholebody exposure is due almost entirely to gamma radiation. With skin contamination, the greatest part of the injury is due to the beta component since beta may be absorbed in the layers of the skin. However, it can be easily removed by brushing.



CONTAMINATION VS EXPOSURE

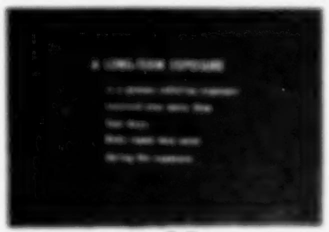
V-23

NOTE: It is important to emphasize the difference between exposure and contamination. The following example may be be used. A person wearing perfume or cologne may be compared to one who is contaminated by fallout because the substance is on his body. Another who smells the perfume or cologne is exposed and may be compared to one exposed to nuclear radiation. The fallout is not on his body but he is receiving rays of radiation.

3. In considering the possible effects of gamma radiation on the body, it is necessary to distinguish between a short term exposure and a long term exposure.

V-24

4. A short term exposure is a gamma radiation exposure received over a period of about 4 days or less. Little or no body repair occurs during the period of exposure.



V-25

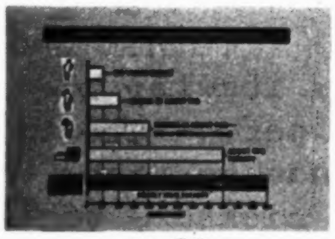
5. A long term exposure is a gamma radiation exposure received over more than four days. Body repair may occur after the first four days of exposure.

6. It is important to make a distinction between long term and short term exposure. Since there is

partial body repair in long term exposures, a person can tolerate greater doses than in a short term exposure.

7. It has been estimated that about 90% of the body injury caused by a sublethal exposure to radiation is repairable while 10% of the injury is unrepairable. About 90 days are required for full repair to take place in the 90% repairable portion of the injury.

8. Large short term exposures may cause serious sickness or death. The seriousness depends on the size of the dose and individual susceptibility. Small doses can be tolerated over a long period of time. The total amount received in this fashion without causing any illnesses may be many times greater than an equivalent short term dose.


V-26

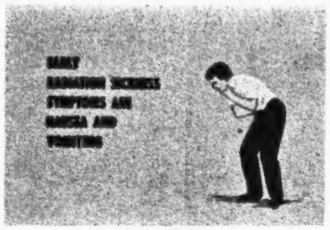
9. Short term exposure to gamma radiation will have the following effects on most individuals. Others may have greater or lesser tolerances.

Short-term dose (roentgens)	Consequences or effects of radiation exposure
Less than 100R	Few persons get sick.
100 - 300R	Some illness likely.
300 - 600R	Illness and occasionally death will result.
Over 600R	Death is likely.

N. Radiation Sickness

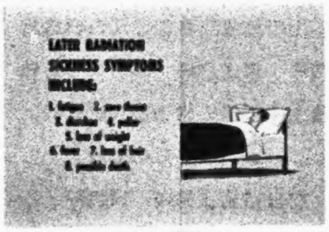
1. Persons exposed to large amounts of radiation will develop radiation sickness. Radiation sickness is neither contagious nor infectious; a person cannot catch it from others.

2. Symptoms appear in an individual only after a sufficient number of body cells have been damaged or destroyed


EARLY
RADIATION SICKNESS
SYMPTOMS ARE
NAUSEA AND
VOMITING

V-27

3. Observable early symptoms of possible radiation sickness are nausea, vomiting, diarrhea, fever, and listlessness. Some or all of these symptoms may appear within the first three days. They may then disappear, reappearing after a week or so. They are sometimes accompanied by bloody diarrhea and swelling of the nasal passages, mouth, and throat.


LATER RADIATION
SICKNESS SYMPTOMS
INCLUDE:
1. fatigue 2. sore throat
3. diarrhea 4. pallor
5. loss of weight
6. fever 7. loss of hair
8. possible death

V-28

4. The early symptoms may vanish after a few days and the exposed individual feels and appears normal, however, blood changes may be taking place. After a week or more, other symptoms may manifest themselves, such as fatigue, sore throat, diarrhea, pallor, loss of weight, fever, loss of hair, and possible death.

O. Treatment of Radiation Sickness

There is no treatment for radiation sickness itself, however, the symptoms manifested by an exposed person should be treated. An affected person should be made to rest. He may be given aspirin for a headache, motion sickness tablets for nausea, liquids for diarrhea, etc. Remember, RADIATION SICKNESS IS NOT CONTAGIOUS.

NOTE: The film, Operation Cue, should serve as an excellent summary for this lesson. If available, show it at this time.

This film points out the contrast between the Nevada test in 1955 and present nuclear devices, then continues as a documentary report on the Operation Cue exercise of 1955 as told from the viewpoint of a newspaperwoman who was invited as an observer. The picture features unusual slow motion photography of the effects of blast on houses, radio towers, etc.

Discuss Operation Cue.

LESSON PLAN NO. III

Modern Weapons and
Radioactive Fallout (Protection)

V-29

LESSON TITLE: Modern Weapons and Radioactive Fallout (Protection)

OBJECTIVE:

To develop an understanding of how time, distance, and shielding are used to minimize the effects of fallout radiation.

REFERENCES:

Personal and Family Survival, SM-3-11 (Revised)
The Effects of Nuclear Weapons,

Radiological Defense Textbook, DOD, OCD, March 1963

TRAINING AIDS:

1. Visual set - Personal and Family Survival, Frames 29-49
2. Projectors and screen
3. Film, About Fallout

A. Introduction

Protection is that which preserves or shields from injury. Protection from radiation injury is a matter of common sense application of certain basic principles. Once they are understood, these principles can be applied individually or collectively to reduce or eliminate danger from radiation.

In this lesson, we will define these principles, learn how we can individually apply them for our own protection, and how they have been applied in the national fallout shelter program.

B. Radiation Defined

1. Radiation is the emission of a form of energy in all directions from a common source.

2. Heat and light are the most common types of electromagnetic radiation.

3. Nuclear radiation is similar to radiation of heat and light in many ways.
    a. It travels in straight lines and with the same speed.
    b. Excessive exposure can damage body cells.
    c. It is possible to provide protection against it.

4. Nuclear radiation differs from radiation of heat and light.
    a. It cannot be seen, felt, smelled, or tasted.
    b. It has much greater penetrating power.

C. Health Hazards from Radiation

RADIATION HAZARDS

V-30

1. The body can be damaged from nuclear radiation in four ways. In descending order of importance, these are:
    a. External Radiation Exposure. External exposure to gamma radiation can be compared to exposure of the body to the sun's rays. It is the most serious threat to survival because:
        (1) It can travel great distances from its source to cause injury to people--not as far as the sun's rays but much farther than beta particles.
        (2) It can penetrate dense materials such as building walls without being completely stopped.
        (3) It can penetrate the body to cause damage to internal organs and tissues.
    b. Skin Contamination. Fallout particles which are permitted to remain on the skin can produce an additional hazard. Beta particles in the fallout can cause "beta burns." Although not likely to be fatal, the burns are slow to heal, painful, and are subject to infection.

c. Ingestion of Fallout. If fallout is repeatedly ingested through contaminated food or water, it can cause radiation damage to internal tissues. Although the threat to immediate survival is not great, it may be a serious threat to health in later years.

d. Inhalation of Fallout. Only the very smallest particles of fallout are likely to be inhaled. Under most conditions, the amount will likely be too little to be a serious hazard.

D. Principles of Protection

V-31

1. The basic elements of protection against external nuclear radiation are the same as those for other types of radiation. One protection from sunburn is to limit the time during which the body is exposed to the sun's radiation. Protection from the heat of a fire is readily provided by moving away from it, that is, by putting distance between oneself and the source of the heat radiation. Protection from the sun's rays can also be provided by putting up an umbrella. Protection from the heat of a fire can be provided by putting something between oneself and heat rays from the fire. The umbrella or whatever is put between oneself and the source of the radiation acts as a shield. The three basic elements of protection then are time, distance, and shielding. All of these can be applied in providing protection from gamma radiation, either singly or in combination.

E. Pertinent Characteristics of Radiation

Characteristics of radiation which are pertinent to application of protective measures are: (1) radiation decays with time, (2) radiation decreases with distance from the source, and (3) materials absorb radiation.

1. Radiation decay

V-32

a. Just as ice melts in time, flashlight brilliance decreases with time, and the heat from a fire decreases as the fire burns down, radiation decays with time.

b. The total amount of radiation from fallout decreases with time because fallout contains many different kinds of radioactive materials--isotopes they are called. Some of these "die" more quickly than others.

c. To understand this, consider the animals on Noah's ark. Each kind of animal has a different life expectancy or average length of life. The average mouse, for example, lives about two years while the average cat lives about ten years. Other animals have different average life length. If the rain had lasted long enough, the shorter lived animals would have begun to die off. If no new animals had been born, the total number of animals on the ark would have decreased more and more as time went on.

V-33

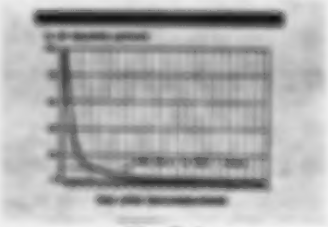
d. Theoretically, radioactivity never dies completely. However, it does half die and it does this systematically. Each radioactive isotope loses half of its intensity in a definite period of time. This period of time is called its half-life.

e. For example, the half-life of the radioactive isotope Sodium 24 is 15 hours. This means that at the end of 15 hours, the radioactivity will be only half as great as it was at the beginning of this period. At the end of another 15 hours, the intensity will again be decreased by half. It will then be only one-fourth as great as it was originally. This goes on indefinitely. While in theory the radioactivity will never totally die out, it will become so infinitesimally small that it will be insignificant as a hazard.

f. Some radioactive isotopes have half-lives of only seconds or minutes. Others have half lives of many years.

The half-life of another radioactive isotope, Strontium 90, is approximately 28 years. Thus, it will take this isotope 28 years to lose half of its original intensity and another 28 years to reduce to one-fourth of its original intensity.

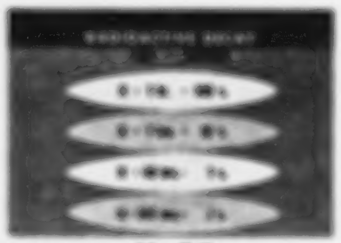
g. Fortunately most of the radioactive isotopes in fallout are relatively shortlived and the total amount of radiation decreases rapidly in the first few hours. The rate of decay becomes less rapid as time goes on because the isotopes with short half-lives will have lost their strength.



V-34

h. The effect can be shown clearly by this chart of radiation decay. Since fallout is not always composed of the same isotopes in the same proportion, this chart is not an exact picture of what will be true in any particular situation. However, it represents the average situation and the actual is not likely to be very much different.

i. Another way to anticipate what the radiation decay will be is by use of the 7:10 Rule of Thumb which is that FOR EVERY SEVENFOLD INCREASE IN TIME AFTER DETONATION, THE RADIATION DOSE RATE DECREASES TENFOLD.

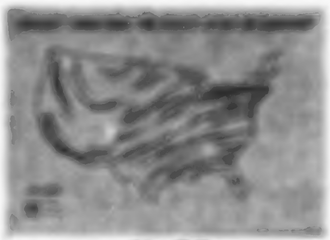


V-35

j. For example, if the dose rate one hour after detonation is at its maximum amount, seven hours later it will be down to 10 percent of that amount. Thus, 90 percent of the radiation will have decayed in the first seven hours. Forty-nine hours or approximately two days after detonation, the dose rate will be only one percent of the intensity that it was in the beginning. At 7 x 49 hours or 343 hours, approximately two weeks after detonation the dose rate will be only .1 percent of the initial rate. As explained with the chart, this rule will not give the exact answer in every case but it will be close enough for practical purposes.

V-36

k. This slide shows fallout conditions 24 hours after a hypothetical large scale attack on the U. S. About 70 percent of the nation's area would have troublesome fallout, and lethal radiation hazards would prevail over about one-fifth of the country. If there were no recurring attacks, decay of radiation would predominate over its further spread after one day.


V-37

l. This slide illustrates fallout conditions two weeks after detonation. Only about 5 percent of the nation would have a fallout problem. Only in very limited area is the dose rate as high as 5 r/h. In most of the areas, resupply operations are possible and recovery and restoration activities could have started.

m. Research and study have shown these fallout conditions to be close enough to provide a basis for the National Fallout Shelter Program. The basic principle of this program is to provide maximum protection to people during the early days in which radiation intensity will be greatest. This limits the TIME during which people are exposed to intensities of radiation.

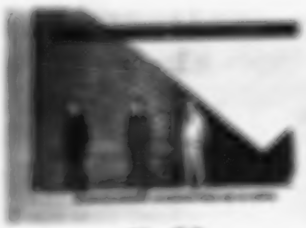
n. Time can also be used as a protective measure by keeping the period of exposure down to an absolute minimum. As an example and for simplicity, let us disregard the decay of radioactive materials in fallout and assume we are in an area where the dose rate remains constant at 20 r/h. In one hour we would be exposed to 20 roentgens of radiation. If we stayed two hours, we would be exposed to 40 r. Thus, if we had to go into such an area, careful planning should be done to minimize the time we are to spend there.

2. Radiation Decreases with Distance

a. The farther you are away from a light, the more difficult it is to read a book. The greater the distance from the source of light to the book, the fewer the number of rays of light that strike the book.

V-38

b. This can be demonstrated by use of a lighted slide or film strip projector. Stand in front of the projector, so near to it that no light appears on the screen. Point out that you are receiving all of the rays from the light source. As you move away from the projector toward the screen, your shadow will appear on a background of light. Point out that the farther you go, the more light misses you and reaches the screen.


V-39

c. Nuclear radiation works the same way. The farther you can get from it, the less the intensity which reaches you.

d. The upper floors of a large building generally offer better protection than the lower floors. The top floor or two, however, may not offer adequate protection because of the contribution from fallout on the roof. Floors opposite roofs of other buildings or floors with terraces may not offer adequate protection because of fallout deposited on these areas.

Thus, DISTANCE is one of the elements of protection.

3. Shielding
   a. Light can penetrate glass and heat can penetrate thin materials. However, not all of the light or all of the heat gets through.

V-40

NOTE: Demonstrate this by projecting a slide on the screen. Then place a single sheet of cellophane, such as that from a cigarette package, against the front of the lens. Point out that the brilliance of the image is reduced. Double the thickness of the cellophane and note again the effect. Double once more to make the point that if enough thicknesses of even a transparent material like cellphane are used, they will cut off all the light.

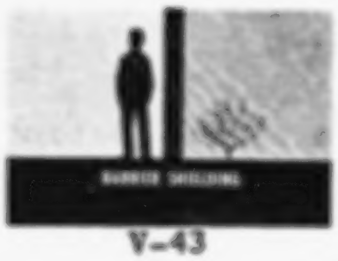
   b. The same principle applies to nuclear radiation. Another means of achieving protection from radiation is to place a barrier or shield between the source of radiation and the individual.

V-41

c. At one time man used a shield to protect himself from the arrows or spears of an enemy. Knights wore armor to shield their bodies from the missiles of an opponent. Man built walls around his cities as a means of shielding or protecting himself. In more recent times sandbags, hardened sites, armored vehicles, tanks, etc., have been used to shield one from enemy weapons.

V-42

d. Shielding can also be used to protect one from gamma radiation. The better the shield or barrier between an individual and a source of radiation the more protection an individual is afforded. A fallout shelter is a shield against radiation. It provides the most practical means of protecting people from external gamma exposure.



V-43

e. Barrier shielding is effective because some of the gamma rays are absorbed in their passage through the shield; thus, fewer rays emerge than enter. As the atoms which make up the shield material are packed more closely together, more of the entering gamma rays experience absorption by collision with one of these atoms. The denser the array of atoms, the greater the amount of gamma radiation that is absorbed; or, the denser the material, the more protection it affords.

V-44

f. The effectiveness of a given substance in decreasing the intensity of radiation is sometimes expressed by means of a quantity called the "half value layer thickness." This is defined as a layer of shielding required to reduce the intensity of gamma radiation one half. Although radiation is reduced by barriers, no matter how many half thicknesses we have, some radiation will always get through. This is the same kind of story told of the frog who was caught in a well and started to jump out. Each jump took him half of the remaining distance to the top. In this particular case the frog is still jumping and will never quite get out.

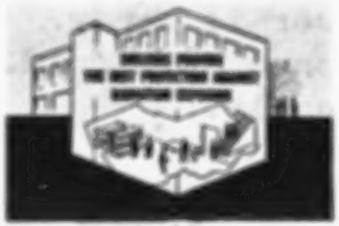
V-45

g. Half value layer thicknesses will differ depending on the material used. The more dense the material, the thinner the half value layer required for the same amount of protection. Most of us are aware of the fact that lead offers excellent protection from radiation, however, such protection is very expensive. There are other more common and much less expensive materials which will afford the same protection. However, a larger amount of other material will be required to make up one half thickness. Some comparative thickness of materials which offer about the same degree of shielding are:

(1) Lead - 2.5 inches
(2) Steel - 7 inches
(3) Concrete - 24 inches
(4) Earth - 30 inches
(5) Water - 50 inches
(6) Wood - 90 inches

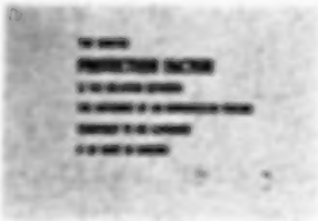
In the case of barrier shielding, it is a matter of how much weight of any material you can get between you and the radioactive source. One hundred pounds of paper will be just as effective as 100 pounds of lead, concrete, earth, or any other material.

4. Combined Shielding



V-46

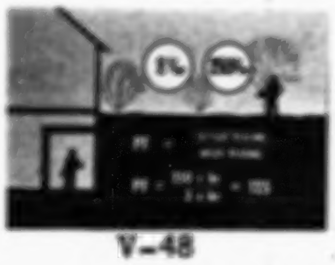
a. Fallout shelters take advantage of the effects of both shielding and distance in providing protection from external gamma radiation. Inhabitants of this building are protected by many barriers such as walls, floors, ceilings, and bricks. At the same time, by sheltering themselves in the central or core area of the building they have placed as much distance between themselves and fallout as possible.



V-47

b. Shelter Protection Factor

(1) The effectiveness of the protection provided by shielding and distance is measured by the shelter protection factor. This may be defined as the relation between the exposure of an unprotected person compared to his exposure if he were in a shelter.



V-48

c. For example, an unprotected person would be exposed to 125 times more radiation than a person inside a shelter with a protection factor of 125.

5. Application of Protective Principles

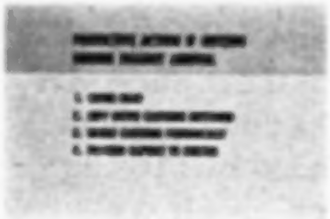
a. The national fallout shelter program was developed to make the best possible application of these protective principles--time, distance, and shielding.

b. In simplest terms this program is to protect people from gamma radiation for such time as is necessary to permit the radiation to decay to relatively harmless levels. The protection is provided by combining distance and shielding.

c. These protective principles can also be applied by individuals in a number of ways.

(1) If possible, get to shelter before fallout arrives.

(2) If the presence of fallout is suspected before an individual can reach shelter,



V-49

(a) Cover the head with a hat, a piece of cloth, a newspaper, or whatever is handy.

(b) Keep all outer clothing buttoned or zipped. Expose as little skin as possible.

(c) Brush outer clothing periodically.

(d) On arrival at shelter, remove the contaminated outer clothing as quickly as possible and wash, brush, wipe, or otherwise remove the fallout particles from the body.

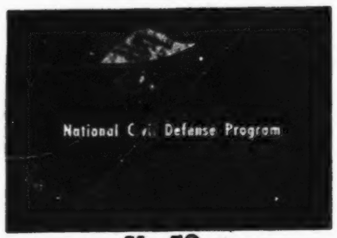
(e) Do anything which will help to reduce the time during which fallout is near to the body.

NOTE: The film, About Fallout, should serve as an excellent summary for this lesson. If available show it at this time.

About Fallout is a most definitive film on the effects of fallout radiation. The film is designed to dispel many of the common myths and fallacies now surrounding the subject in the public mind--and to present the facts, as clearly and simply as possible, in everday layman's terms. Based on the Government's many intensive scientific studies, it uses both animation and live action to illustrate the basic nature of fallout radiation. Also discussed are the effects of fallout on the cells of the body, what it would do to food and water after a nuclear attack, and what simple common-sense steps can be taken to guard against its dangers.

Discuss About Fallout.

LESSON PLAN NO. IV



V-50

LESSON TITLE: National Civil Defense Program

OBJECTIVES:

1. To develop an understanding of the rationale for the National Civil Defense Program.
2. To establish the concept that civil defense is a responsibility of the Federal Government, State Government, local government, and the individual.
3. To make students aware of the planning being done at all levels of government to minimize the effects of a nuclear attack upon this Nation.

REFERENCES:

Personal and Family Survival, SM-3-11, (Revised)
Civil Defense 1965, MP-30
Federal Civil Defense Guide, Part A, Chapters I and II

TRAINING AIDS:

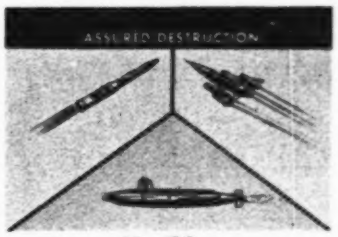
1. Visual set - Personal and Family Survi , Frames 50-71
2. Projector and screen

A. Introduction

In the last lesson we discussed how Time, Distance, and Shielding can be used to afford protection from fallout radiation. We will now consider how these three factors are used by our government in defense planning. Our national civil defense plans are based on the premise that if this country is ever subjected to nuclear attack, more lives can be saved at less cost with a nationwide fallout shelter system than with any other single defensive system.

B. Department of Defense Strategic Objectives

In an age of nuclear weapons, United States continental defense forces have two strategic objectives:



V-51

1. Assured Destruction

The first objective is to deter a deliberate nuclear attack upon the United States and its allies by maintaining a clear and convincing capability to inflict unacceptable damage on an attacker, even if that attacker were to strike first. The Defense Department terms this capability "Assured Destruction." In the two decades since the end of World War II, the United States has built its strategic offensive forces to the point where they are superior in number and quality to those of any other nation. In 1965 the United States had:

-- More than 850 land-based intercontinental ballistic missiles.

-- More than 300 nuclear-armed missiles in Polaris submarines.

-- More than 900 strategic bombers, half of them ready at all times to be airborne within 15 minutes.

These and other elements of American military power stand as the free world's strongest deterrent to nuclear aggression. By assuring the destruction of an aggressor nation, they make nuclear attack improbable. But, they do not make it impossible.

DAMAGE LIMITATION
NATIONWIDE FALLOUT SHELTER PROGRAM

V-52

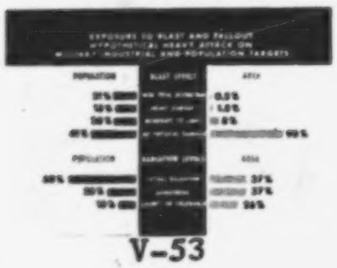
2. Damage Limitation

The second objective is to limit damage to our population and industrial capacity in the event of nuclear attack. The Department of Defense (DOD) terms this capability "Damage Limitation." This establishes the basic goal of civil defense, which stated, is to provide for the survival of the American population in the event of a nuclear attack on the United States. Civil defense even in combination with other elements of strategic defense, could not prevent much death and destruction in the wake of an all-out nuclear attack. However, with proper preparations which are well within the boundaries of technical and economic feasibility, millions of American lives would be saved to sustain our Nation.

C. Rationale of Fallout Shelter System

The Department of Defense has conducted many studies of possible attack patterns on this Nation. The attacks covered various combinations of strikes against military installations, urban-industrial areas, and population centers. They assumed the use of many different size weapons, various combinations of airbursts, and ground bursts, and many other complex variables. All of these studies clearly demonstrate that an adequate fallout shelter system could contribute greatly to our survival and our ability to recover from the devastation caused by an attack. Fallout shelters would protect many millions of persons until such time as radiation had decayed to tolerable levels.

D. Exposure to Blast and Fallout from Hypothetical Attack on Military, Industrial and Population Targets



V-53

1. This chart suggests the percentage of population subject to various levels of radiation and blast overpressure. The information portrayed here is based on many different types of theoretical attacks. They assumed detonations in excess of 5,000 megatons on the targets, with about 65 percent of the detonations on the surface. Under the assumptions used, 90 percent of the land area and 41 percent of the population would not be subject to damage or injury from the direct effects of the weapons. An additional 20 percent of the population, some 40 million people would have an excellent chance of survival and another 18 percent would have better than a 50/50 chance of surviving the blast.

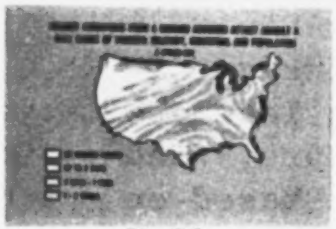
2. Even though a large portion of the population would survive the blast effects, 85 percent would be subject to lethal or disabling radiation levels which would cover about 75 percent of the land area. Only 15 percent of the population would be free from a serious fallout hazard.

3. Studies such as this clearly demonstrate that a civil defense program with primary emphasis on an adequate fallout shelter system is an essential step in the defense planning of this Nation.

4. It is true that those people who might be close to points of detonation would have little chance of survival. However, only one-half of one percent of the land area of the United States would be subjected to those effects that cause total destruction. About 98 percent of the land area would be free of heavy damage and approximately 80 percent of the population would be in locations where survival is more likely from immediate effects. Fallout shelter is essential to assure that those who do survive the initial effects will be protected from lethal radiation.

E. Fallout Condition from a Random Assumed Attack

(Spring Day)



V-54

1. The next two slides show the geographic distribution of various levels of radioactivity resulting from an assumed attack. The differences in distribution of fallout result from the fact that the map on the first slide used winds of a spring day.

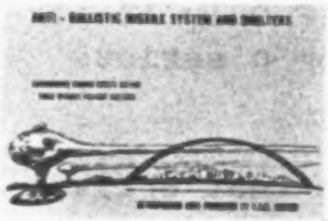
(Fall Day)

V-55

2. The map on the second slide used winds from a fall day. On other days with other winds, the patterns could be significantly different. It is clear from these maps that fallout constitutes a hazard which must be coped with in all parts of the country.

F. Anti-Ballistic Missile Systems and Shelter

Fallout shelters are necessary for the defense requirement of an effective anti-ballistic missile system.



V-56

This slide depicts the relationship between anti-ballistic missile (ABM) systems and shelters. While shelters have value with or without an anti-ballistic missile system, an anti-ballistic missile system has little value for the protection of population without shelters for this reason:

The people in areas protected by ABMs can be exposed to lethal fallout radiation even though enemy weapons do not penetrate the protected areas. Surrounding groundbursts could be targeted to strike windward of the protected areas. The wind carried fallout could kill those without fallout shelters in the area.

The relationship of shelters and anti-ballistic missile systems illustrates the necessity for integrating civil defense and other defense programs. Maximum protection of our people and Nation is the purpose of all of our defense efforts. This objective requires a close coordination of civilian and military defense efforts.

G. A Nationwide Fallout Shelter System

Improved anti-aircraft systems, anti-ballistic missiles, anti-satellite devices and a nationwide fallout shelter system are parts of the strategic defense program of the U. S. Defense Department. Studies show, however, that a nationwide fallout shelter system has a greater lifesaving potential for the investment involved than any other element of strategic defense, and that it is, in fact, fundamental to the damage-limiting effectiveness of other strategic defense elements.

H. What is Civil Defense

Civil defense in the United States is civil government--Federal, State, and local--prepared for effective action to limit damage and speed recovery in the event of a major disaster.

At the national level, civil defense emphasizes the role of civil government in national defense. This is not the whole of civil defense. Government must also be prepared to act effectively in the wake of many peacetime disasters, and this is particularly required of States and localities where these disasters strike. But enemy attack would threaten the life of the Nation, and for this reason demands first attention in a nationwide system of civil defense.

RESPONSIBILITY
FOR CIVIL DEFENSE

V-57

The Federal Civil Defense Act of 1950, as amended, provides that "the responsibility for civil defense shall be vested jointly in the Federal Government and the several States and their political subdivisions." This assignment of civil defense responsibility is in keeping with the concept that civil defense is a part of civil government and, as such, should be organized in line with the existing system of government in the United States. There is no direct chain-of-command from the Federal to the local level in civil defense, just as there is no direct chain-of-command from the Federal to the local level in the civilian governmental structure of our nation. The decentralized organization of civil defense also is in recognition of the probable conditions which would exist following an all-out nuclear attack. Many areas would be isolated and would have to conduct initial recovery actions with their own resources.

I. Organizational Structure of Federal Civil Defense

V-58

The Federal Office of Civil Defense is headed by a Director of Civil Defense who reports directly to the civilian Secretary of the Army. In addition to a small headquarters staff in the Pentagon, there are eight OCD regional offices, and it is at this level that direct Federal control of the civil defense structure ends. But the end of the control line is not the end of the responsibility. In civil defense, the Federal Government has the responsibility to give all possible assistance to State and local governments and to provide the cohesiveness in the program which is essential to national defense requirements. In directing the national civil defense program, the Office of Civil Defense deals with 50 States, 5 outlying areas and the District of Columbia, more than 3,000 counties or parishes, and more than 17,000 incorporated local governments. In addition, OCD works with some 30 other Federal agencies which have been assigned specific emergency responsibilities by Presidential Executive Orders.

J. Civil Defense Program Areas

1. Shelters

V-59

The development of a nationwide fallout shelter system is at the core of civil defense because of its lifesaving potential in the damage limitation structure of national defense. The aim is to achieve fallout shielding for all Americans through a network of dual-use public shelter space and by the encouragement of private shelter development, especially in rural areas where there may be little public shelter potential. The goal is fallout shelters for the total population wherever they may be. The spaces take into consideration population concentrations in industrial and residential areas at different times. A very realistic plan is in operation to provide the necessary shelter spaces and much progress has been made. The details of this plan we shall discuss in the next lesson.

2. Attack Warning
   a. Studies have been made on the complex subject of how a nuclear war might start and many experts believe that any all-out nuclear attack would be preceded by a period of rising international tension which, in itself, would constitute a type of warning. Nevertheless, should an enemy launch an attack a rapid, nationwide system of warning could save millions of lives.

   b. The present Civil Defense Warning System is a combination of Federal, State, and local systems. The Federal portion of the system is termed the National Warning System (NAWAS), and it is essentially an extension of the military warning and detection systems that feed into the Combat Operations Center of the North American Air Defense Command at Colorado Springs, Colorado. NAWAS consists principally of three major OCD Warning Centers (one at the NORAD Combat Operations Center, one at OCD Region 5 Headquarters, and one in the Washington, D. C. area). There are back-up centers at the other OCD Regional Headquarters. They are linked by a special voice communications system to more than 700 warning points throughout the Nation. These warning points, manned on a 24-hour basis, are located at key Federal facilities, at State capitols, and in numerous cities. Through a relay system, these warning points send warning information to local authorities who are responsible for sounding public warning devices, such as sirens.

c. The Warning Network.

(1) If an attack were launched against our continent, the following sequence of events would probably take place.

V-60

(2) An approaching enemy missile or plane would be detected by one or more radar stations manned by the military 24 hours a day.

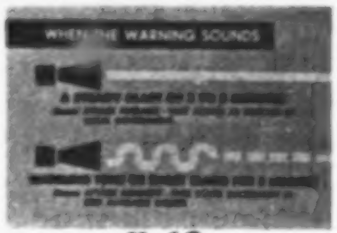
V-61

(3) Information of the impending attack would be fed into the North American Air Defense Command (NORAD). At the same time that our military forces would be alerted to strike back, warning of the attack would go out over the National Warning System (NAWAS) to the warning points at State and local levels.

V-62

(4) From these locations the warning would be passed down to thousands of secondary warning points in local communities. Local systems would then be used to warn the public.

d. Warning Signals



V-63

There are two civil defense warning signals to alert the public to approaching enemy attack. Everyone should know what to do when each of these warning signals is sounded. These warning signals may be sounded on horns, whistles, or sirens. Regardless of the warning device used, each person should be able to recognize each signal instantly and know what action to take.

(1) Alert Signal

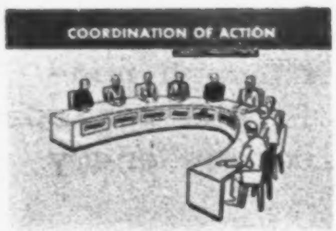
A STEADY 3-to-5 MINUTE SOUNDING of the siren or other warning device is the "Alert" signal. This signal is used if there is evidence of impending attack. When the alert signal is heard, each person should turn on the radio for emergency instructions. The alert signal will mean that there is some time to take predetermined or survival actions, such as movement to public or family shelters. The survival measures must be predetermined in case of this warning and incorporated into the local Civil Defense survival plan. Whatever an individual is to do should be done at once. Family practice and drill should also be held periodically.

(2) Take Cover

A WAILING TONE OR A SERIES OF SHORT BLASTS FOR 3 MINUTES on sirens or other signaling devices means take cover. This signal is used to indicate that hostile attack is imminent and that time permits only the most rapid movement to shelter. It is essential, then, to go as quickly as possible to the nearest shelter. People who are in a building should move at once to a marked shelter area if one is available in the building, otherwise to the best protected part of the building. People who are outside should run, not walk, to the nearest cover.

An "all clear" signal will not be sounded on public warning devices. Information on the further action required will be passed by voice communications media, probably radio.

(3) Coordination of Action



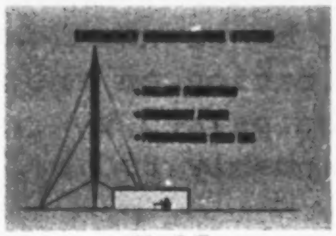
V-64

Very important in civil defense emergency operations is the communication of information--pulling in information on the nature of the emergency and the damage caused, and putting out directions and guidance so that those who are responsible for emergency actions can move effectively. Coordinating this flow of essential emergency information and guidance is a primary responsibility of the executive head of a governmental unit, assisted by his civil defense director, and other government officials. To carry out this job, they need a protected headquarters from which to operate. The Office of Civil Defense assists State and local governments in developing these emergency headquarters--usually termed "emergency operations centers"-- by matching funds for the development of centers and necessary emergency equipment which meet OCD standards.

(4) Operational Communications

The primary network for carrying Federal-State civil defense operational information is the National Communications System No. 1 (NACOM 1) which consists of a leased teletype network with alternate telephone facilities. NACOM 1 connects OCD national and regional offices, State civil defense offices, the national emergency relocation sites of selected Federal agencies, and interconnects with commercial, military, and other Government teletype communication systems. As a back-up to NACOM 1, OCD is developing National Communications System No. 2 (NACOM 2) which is a high-frequency radio network using voice, code, and radioteletype transmissions.

(5) Communications with the Public



V-65

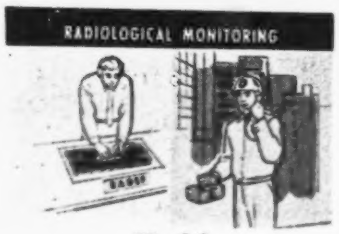
Getting official information and guidance to the public in time of national emergency could be directly responsible for saving millions of lives. An Emergency Broadcast System (EBS) has been established to provide the President and the Federal Government, and State and local governments with a means of communicating with the public through non-government broadcast stations in the periods preceding, during, and following any enemy attack.

On the implementation of the EBS plan in a national emergency, those commercial broadcasting stations holding National Defense Emergency Authorizations issued by the Federal Communications Commission (FCC) remain on the air at their regular broadcasting frequencies to transmit official information and instructions. All other broadcasting stations leave the air.

The Office of Civil Defense is working closely with FCC and the broadcast industry to assure that major EBS stations could continue to operate in a fallout environment following a nuclear attack. OCD is funding a Civil Defense Broadcast Station Protection Program consisting of three main parts:

(a) Fallout protection at broadcast transmitting sites to protect the people needed to operate the stations.
(b) Emergency power to provide the stations with a capability to continue operation if normal power is disrupted.
(c) Radio program links and associated equipment needed to transmit local, State, and regional programming from the seats of government to EBS stations and on to the public.

3. Radiological Monitoring

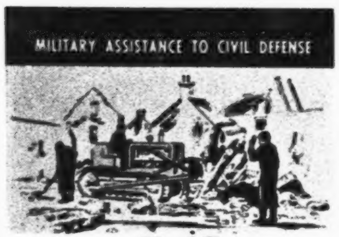


V-66

After a nuclear attack, information concerning radioactive fallout would be critical to survival and recovery actions. Every level of government would need information on the post-attack fallout conditions in order for government officials to make sound decisions.

To obtain adequate coverage for civilian units of government, OCD estimates that a large number of radiological monitoring stations will be needed throughout the Nation. Many of these are or will be located in public fallout shelters. Others are located at Federal, State, and local governmental facilities.

4. Military Support of Civil Defense


MILITARY ASSISTANCE TO CIVIL DEFENSE

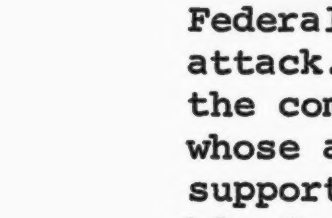
V-67

Military forces are in a position to render valuable assistance to civil authorities in the event of a nuclear attack. A plan has been developed to use the State Adjutants General and their headquarters to plan for military support of civil defense and to direct military forces committed within the State for civil defense assistance in the event of a nuclear attack.

Under the plan, the State Adjutant General and the State military headquarters will be brought into Federal active service in the event of a nuclear attack. The State Adjutant General will then be under the command of the continental U. S. Army Commander in whose area he is located. He will command the military support forces within his State which are made available for the military support mission.

The plan in no way assigns civil defense to the military, Strong as they are, the military forces represent only a small percentage of United States manpower and equipment potential. Not only would it be physically impossible for the military to take over the responsibility for civil defense across the Nation, but it would also conflict with the primary responsibility of the Armed Forces to carry out their military mission. The role of the military in civil defense is to support civil authority.

5. Training, Education, and Information



V-68

a. Training. Public officials, government employees, including civil defense personnel and other persons needed to augment government in the tasks and functions required in an emergency are being trained. The OCD operates a Staff College at Battle Creek, Michigan to assist in this training requirement. Many universities throughout the country are also under contract to OCD to provide civil defense training. Selected Army posts train civilian radiological monitors.

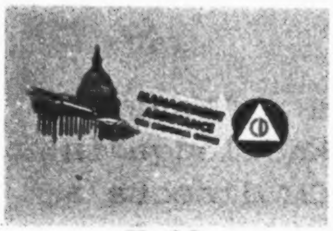
Under the Federal Contributions Program, the Federal Government may contribute up to 50 percent of authorized expenses for civil defense training of State and local personnel.

Through the CDAE Program, training for radiological monitors is being conducted at the local level. This program is completely funded by the Federal Government.

b. Education. Education programs have been launched to assist individuals and families in planning to meet emergency situations and in developing an understanding of and familiarity with community disaster plans. This Personal and Family Survival course has this as an objective.

c. Information. The Federal Government has developed technical and general civil defense information materials. These include program materials for use by the mass media and the public, publication kits, exhibits, displays, and films. These materials are available to State and local governments for public information programs. Public information programs are being conducted to explain to the public the need for civil defense, the civil defense program, progress of the program, and the responsibilities of individuals, industries, civic, and other groups.

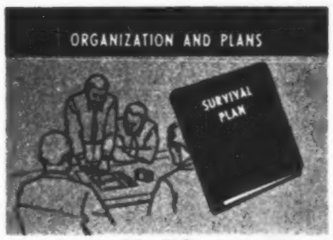
6. Management Assistance, Supplies, and Equipment



V-69

State and local civil defense organizations also receive donations of Federal surplus property, grants of radiological equipment and supplies for stocking eligible public shelters.

7. Organization and Plans



V-70

In addition to emergency functions discussed previously, there are others that must be planned for and carried out if States and communities are to have a balanced civil defense program. Areas to be provided for include emergency operations, intelligence, health, police, emergency information, supply, transportation, public works, engineering, rescue, and welfare. The Office of Civil Defense encourages and assists States and local communities in preparing or updating plans to accomplish these functions.

Appropriate numbers of personnel must be assigned to carry out the functions identified in the plans. They must be given the required training to develop the skills to do their jobs.

8. Community Shelter Planning
In addition to locating, marking, and stocking shelters in a community, a major job is to prepare shelters for use in an emergency. This includes plans to allocate spaces in community shelters to people in the area, procedures to get them to shelter, identification of shelter deficiencies as well as interim measures to meet this problem in an emergency, and development of a long-range shelter development program for the community's present and future shelter needs. OCD is financing most of this planning work, and is relying heavily on local urban planning professionals to carry it out.

9. Research and Development

RESEARCH & DEVELOPMENT
V-71

The Office of Civil Defense conducts a coordinated research effort to develop the best methods, materials, and facilities for use by civil defense at all levels of government.

Most of the research effort is devoted to a "core program" of long-term nature to improve knowledge in various technical areas. In addition, OCD directs a number of studies each year to provide guidance for policy and operational decisions and to improve civil defense equipment.

SUMMARY
Summarizing, these are the major premises governing the direction of civil defense efforts in the United States:

1. Civil defense is an integral part of the Damage Limitation structure of United States strategic defense.

2. Basic to the civil defense program is the development of a nationwide fallout shelter system which could save tens of millions of lives in the event of nuclear attack. The logical way to develop such a system is to make use first of existing resources which offer shielding from gamma radiation, and to take all practical actions to expand this resource.

3. Effective use of a fallout shelter system under conditions of nuclear attack requires that government at all levels be prepared to direct necessary emergency operations to protect life and speed recovery.

4. United States civil defense is a Federal-State-local program. All Federal civil defense assistance to States and localities is aimed at increasing the operational readiness of these governmental units in the Damage Limitation structure of strategic defense.

5. Any defense system of today must also take into account future needs, and this requires a coordinated program of research and development.

LESSON PLAN NO. V

National Shelter Program
(Community Shelters)

V-72

LESSON TITLE: National Shelter Program (Community Shelters)

OBJECTIVES:

1. To present to students the scope of the National Shelter Program.
2. To provide an understanding of the types of community shelter space approved for Federal marking and stocking.
3. To provide an understanding of the organization and management of community shelters.
4. To familiarize students with some aspects of shelter living.
5. To develop confidence in and support of community shelters.

REFERENCES:

Personal and Family Survival, SM-3-11, (Revised)
Guide for Community Fallout Shelter Management, SM-16.1
Federal Civil Defense Guide, Part A, Chapter II

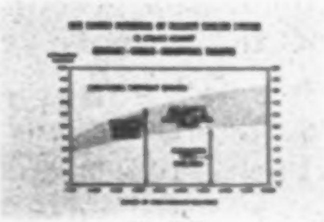
TRAINING AIDS:

1. Film - *Occupying a Public Shelter*
2. Visual set, Personal and Family Survival, Frames 72-90
3. Projector and screen

A. Introduction

During the last lesson we discussed the National Civil Defense Program, its rationale, goals, progress and key elements. We were made aware of the fact that more lives can be saved at less cost through the development of an adequate fallout shelter system than any other defensive measure, should this nation be subjected to a nuclear attack. During this period we will discuss the National Shelter Program - the key element in all of our civil defense planning.

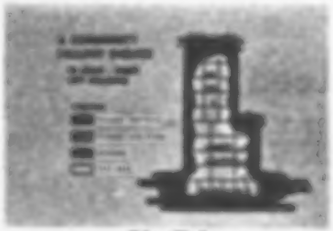
B. Life Saving Potential of the Fallout Shelter System


V-73

This slide shows information from a study conducted by the Department of Defense to investigate the life saving potential of a nationwide fallout shelter system. For example, as shown in this chart, with a 3,000 megaton attack some 40 million people could be saved by a fallout shelter system, increasing the total number of survivors from 80 million to 120 million. The life saving potential of shelters increases with heavier attacks because the radiation hazard increases. The proportion of the population who would survive because they were sheltered, increases even more sharply.

C. History of the Program

1. Studies such as the one we have just discussed helped convince the Federal Government of the merits of a nationwide fallout shelter system. While family shelters are a part of the National Shelter Program and will be very important to many people, it was recognized that home shelters alone could not meet national shelter requirements.


V-74

2. In 1961 a decision was made by the Federal Government to develop a nationwide fallout shelter system. Procedures were developed to determine the degree of protection which structures would offer against penetrating gamma radiation from fallout. Using these procedures, the Department of Defense, assisted by hundreds of specially trained architects and engineers as well as thousands of State and local officials and building owners, conducted a National Fallout Shelter Survey. The purpose of the survey was to locate fallout shelter space in existing buildings. Through this survey, shelter space for millions of people was located. The goal of the National Shelter Program is to locate or develop

shelter space for the total population. This total includes an allowance for population growth and movement between home and work.

D. Priorities of the Shelter Program

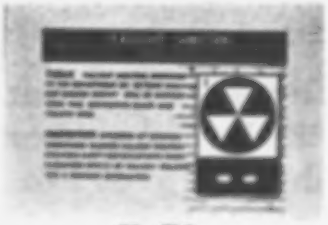
NATIONAL SHELTER SURVEY

V-75

1. Survey - The shelter survey was conducted primarily in 1961 and 1962, however, a system has been developed and implemented to keep the survey up to date. Newly constructed buildings which might meet the requirements for a public fallout shelter are surveyed as rapidly as possible after construction. The initial survey was conducted in two phases. The objective of Phase I was to identify potential fallout shelter in existing buildings. The aim of Phase II was to make a more detailed survey of buildings, survey selected special facilities such as mines and tunnels and to develop information which can be used to bring substandard facilities up to meeting federal standards for public shelters.

   To qualify as a public shelter the following conditions must be met:
   - a. The facility must have a protection factor of 40 or better.
   - b. The facility must have a capacity for 50 people with 10 square feet of floor space or 500 cubic feet of space per person depending on the facility's ventilation system characteristics.
   - c. The building owner must agree to the use of the building as a public shelter.

2. Marking

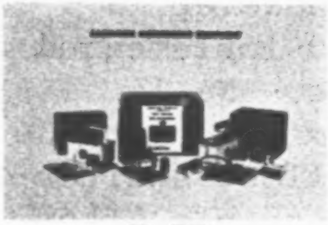


V-76

Buildings selected as public fallout shelters are marked with a distinctive black and yellow sign. This sign is placed on the outside of buildings as well as on the inside to indicate where the shelter area is. It is important that the public know which area in a building provides adequate protection from fallout radiation.

3. Stocking - The Office of Civil Defense provides austere

supplies and equipment for licensed shelters. Once the supplies have been turned over to a county or local government, it is the responsibility of that government to place them in shelters and to perform periodic inspections and maintenance on the items. The supplies consist of the following:


V-77

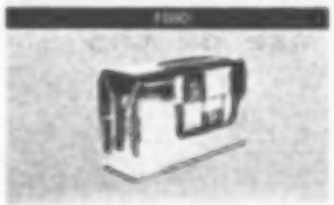
a. Radiation detection kit
   (1) Two dosimeters - radiation
   (2) One high range survey meter
   (3) One low range survey meter
   (4) One dosimeter charger

SANITATION KIT AND CONTENTS
V-78

b. Sanitation Kit

MEDICAL SUPPLIES
V-79

c. Medical Supplies



V-80

d. A 10,000 calorie food supply per person sheltered consisting of survival biscuits or crackers and a carbohydrate supplement.

V-81

e. Water Containers - Filling these containers is a local responsibility. These together with other available water should provide at least 14 quarts of water per person sheltered.

4. Shelter Use

After shelters have been identified, marked, and stocked, communities must develop plans for their use. Although many shelter spaces in the United States have been located, the matching of these spaces to the people, within the established time distance factors is necessary for the identification of shelter deficit areas.

This activity will cover all aspects of Community Shelter Planning which in effect will provide local governments with the tools to assure effective utilization of all shelter by the people in the community.

Three component programs have been developed to facilitate the execution of shelter use. They are:

a. Community Shelter Planning which will produce information concerning shelter locations related to people to be sheltered; procedure for disseminating emergency action information to the public; precise identification of shelter deficits; and a basis for the preparation of a directive for developing or updating local Civil Defense plans.

b. CSP Training which provides necessary support to community shelter planning. This will include training of urban planners, civil defense personnel and the incorporation of CSP techniques in existing curricula of university planning departments.

c. A Community Shelter Planning Information System which will collect the data on which to build other program developments related to the creation of shelter space through Packaged Ventilation Kits, Smaller Structures Survey, Evaluation of Fallout Protection in Homes and other shelter development activities.

E. Progress

1. To date approximately _____ million spaces have been identified, approximately _____ have been licensed or marked in _____ structures. Supplies for _____ million spaces have been placed in shelters. (Instructors may get latest figures from their local civil defense officials.)

F. Shelter Development

1. Though much progress has been made toward the goal of identifying, marking, and provisioning shelters for the total population, there is still much to be done. The Federal government, as well as State and local governments, is doing a great deal to develop additional shelter to meet residual requirements. Some aspects of these efforts include the following:
    a. Expansion of the present shelter survey program to include structures too small to qualify as public fallout shelters, i.e., small business facilities, duplexes and single family residences.
    b. Provision of architectural and engineering advice and assistance to stimulate the development of dual-purpose low cost or no cost fallout shelters in new construction or major structural modification projects, through the application of various design techniques. This process is called slanting.
    c. Development of plans to identify more precisely the residual shelter requirements and to insure the efficient use of currently available shelter by matching individuals with specific shelter spaces.
    d. Provision of packaged ventilation kits which will significantly increase the usable capacity of some existing shelter space.

G. Advantages of Community Shelters

ADVANTAGES OF
COMMUNITY SHELTERS
Better Prepared
Focus for Recovery Activities
Emergency Skills
Shelter if Away from Home

V-82

1. Whether one prefers a community shelter or a home shelter is an individual matter. Some advantages of community shelters are:
    a. A large group is better prepared to face nuclear attack than a single family.
    b. There is a greater chance of finding people with emergency skills.
    c. Group shelters provide shelter for persons away from home at the time.
    d. Group shelters serve as centers for recovery activities in the post-attack period.
    e. Group shelters serve other community purposes.

H. Planning for Shelter Occupancy

1. In a civil defense emergency, proper staffing, management and operation of a community fallout shelter will be vital to the survival of shelter occupants. Those in shelter must function under an organized plan which takes into account the peculiar problems of shelter life, the special dangers of radioactive fallout and the need for cooperation. It is most important that people come to shelter prepared to meet and effectively deal with the many physical and psychological problems that could arise. In each locality, planning activities are carried out under guidance of local government. The Civil Defense Director and his staff deal with the overall problems related to community survival and select and provide training for other persons who will take leadership responsibilities in local community shelters.

I. Shelter Organization

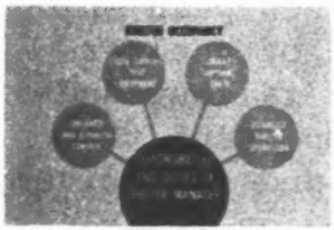
1. Managing a public shelter is not a one man job. An organized staff is required to manage large and small public shelters. It is very important that people with the essential qualifications be selected for the various shelter positions. The plan of organization for each shelter must be determined locally based on the capacity of the shelter, its floor plan, facilities and supplies, as well as on plans for feeding, sleeping, and other in-shelter functions.
2. Shelter Manager

V-83

   a. The shelter manager is responsible for the pre-attack preparation of the shelter facility, and all in-shelter operations during the period of shelter occupancy.
   b. The most important pre-attack duties of the shelter manager consist of the following:
      (1) Assisting in the overall planning to use the shelter.
      (2) Assisting in selection of deputies, assistants and team leaders.
      (3) Developing shelter operations plans.
      (4) Participating in necessary training and assuring appropriate training of his shelter staff.

(5) Assisting in the provisioning of the shelter and in the storage, maintenance and inspection of shelter supplies and equipment.

c. During shelter occupancy, the shelter manager



V-84

(1) Is responsible for checking of all supplies and equipment and testing operability of major shelter equipment.

(2) Receives people into shelter and establishes control.

(3) Directs the organization of the shelter and the establishment of routine shelter operations.

(4) Completes shelter staffing as required.

(5) Orients occupants to shelter.

(6) Provides for programs of training and information.

d. Qualifications for shelter manager

Ideally the shelter manager should have experience in managing large numbers of people under emergency or stress conditions.

He should be an accepted leader in the organization or community which will provide the bulk of the shelter occupants.

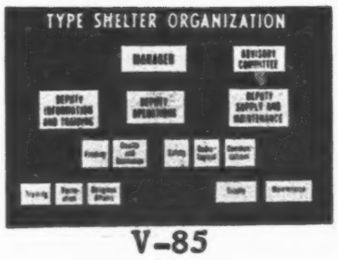
He should be calm in a crisis, capable of making decisions, and adept at improvising.

He should have a working knowledge of the community shelter program, shelter management, and operations and all in-shelter functions.

He should live or work fairly close to the shelter. If the facility is kept locked, he should have ready access to it and keys where required. He should be a responsible and dependable person who:

Is vitally interested in the shelter program.
Would plan and organize his shelter area.
Would supervise the provisioning of the shelter and properly inspect and maintain the supplies and equipment.
Would select and train an adequate shelter staff.

e. Type Shelter Organization


TYPE SHELTER ORGANIZATION
MANAGER
ADVISORY COMMITTEE
DEPUTY INFORMATION AND TRAINING
DEPUTY OPERATIONS
DEPUTY SUPPLY AND MAINTENANCE

V-85

Other staff members also have important duties. In small shelters two or more functions may be assigned to the same staff member.

Administrative Clerk

The administrative clerk assists the manager with administrative and secretarial details of shelter operations.

Member Advisory Committee

Members of this committee represent shelter occupants in presenting problems, recommended solutions and suggestions to the shelter manager.

Deputy - Information and Training

The Deputy for Information and Training is responsible to the manager for the in-shelter information, training, and special activities of shelter occupants.

Chief - Training

This staff member assists in planning, organizing, and conducting all training activities including the scheduling and development of training outlines.

Chief - Recreation

It is the responsibility of this person to plan, and conduct special recreational and social activities in the shelter.

Chief - Religious Affairs

The chief of this team plans and conducts religious services and related programs. As necessary he acts as counselor in assisting to resolve emotional problems.

Deputy for Operations

The Deputy for Operations supervises the assignment of shelterees to bunks, and the operation of feeding, health and sanitation, safety, radiological and communications activities.

Chief - Feeding
This staff member plans and directs the system of food preparation and distribution.

Chief - Health and Sanitation Teams
It is the responsibility of this chief to prescribe and administer medical treatments as appropriate and available.

Chief - Safety Team
The chief of the safety team is responsible for round-the-clock maintenance of order and fire protection within the shelter and emergency escape measures.

Chief - Radiological
The chief shelter monitor is responsible for radiological monitoring and operational checks to see that monitoring equipment is maintained.

Chief - Communications
This staff member is responsible for the operation and maintenance of the communications system.

Deputy - Supply and Maintenance
The Deputy for Supply and Maintenance supervises the reception, inventory, care and issue of all supplies and the maintenance of the shelter mechanical equipment.

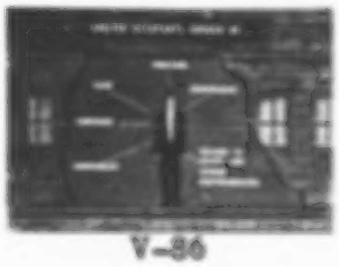
Chief - Supply Team
This chief is responsible for inventorying, collecting, storing, safekeeping and issuing food, water, drugs, health and sanitation supplies, materials, tools, and spare parts to responsible team leaders.

Chief - Maintenance Team
This staff member is responsible for the control, operation, and maintenance of the in-shelter mechanical equipment.

J. Shelter Occupancy

1. Shelter living will be different. During a period of shelter occupancy it is anticipated, based on extensive tests, that most people will be unhappy but normal. Everyone must be prepared to make the best of life under conditions which are remote from the normal living pattern. Since each person must remain in shelter until it is safe to leave, he should be prepared to accept and cooperate with those around him. Remember--Shelter conditions will be no worse than living conditions which thousands have undergone in surviving peacetime catastrophes.

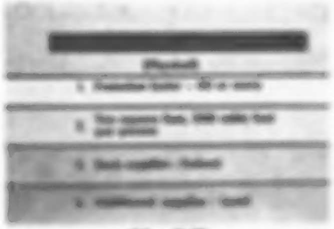
   During shelter occupancy shelterees should be


V-86

Prepared
Calm
Cooperative
Confident
Considerate
Willing to accept and assume responsibilities

NOTE: Discuss the importance of these characteristics of a shelteree in adjusting to occupying a shelter.

2. Shelter Survival Factors


V-87

a. Physical Survival Factors

There are various physical elements to be considered in connection with community fallout shelters. They include:

(1) Radiation shielding of a protection factor of 40 or more.

(2) Space of 10 square feet of floor space or 500 cubic feet of space per person depending on type of ventilation in the facility.

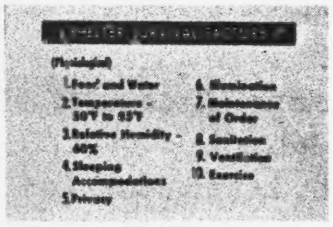
(3) Federally stocked items: 10,000 calories per person of survival biscuits, 3½ gallons of water per shelter space, medical and sanitation supplies, and RADEF instruments.

(4) Local communities may augment the basic supplies and equipment furnished by the Federal Government with such as the following:

Special foods, liquids, medications.

especially for infants and those requiring special diets.
Equipment for food preparation and serving.
Cots and blankets.
Tables and chairs.
Battery-operated radio, telephone, public-address system.
Spiritual and recreational supplies

b. Physiological Survival Items


V-88

(1) Physiological factors are those which affect persons physically and through these physical effects may cause mental and emotional effects. Individual well-being and high morale are prerequisites to social well-being. Some physiological aspects of shelter living include the following:

(a) Food and water will be of immediate concern to everyone. Food should be as varied and savory as the community is able to make it. Attention to proper preparation and serving will pay off in contentment. Water should be palatable and as plentiful as local ingenuity can make it.

(b) Temperatures will be difficult to control unless plans are made. When it gets warmer than 85 degrees F., fatigue, skin irritations and respiratory illnesses may develop. Dispositions are affected and people become irritable.

(c) Low Temperatures in northern areas and during seasons of extreme cold may occur less often but would be equally dangerous to health. Temperature is of real significance to habitability. In the absence of mechanical equipment, the community could provide blankets, or inform all shelterees to bring warm clothing with them.

(d) Humidity will produce discomfort if permitted to rise above 60 percent.

Mechanical dehumidification is desirable but not always available. Manually forced ventilation through filtered or protected apertures would help but will also require prior planning.

(e) Sleep. Shelter living can be greatly improved by satisfactory sleeping arrangements. Cots and blankets are a local responsibility.

(f) Privacy means more to some people than others. Those who are more sensitive will have a more difficult time adjusting. Certain personal functions demand isolation areas. The more adequate space that can be provided for such functions, the better.

(g) The illumination of a shelter probably has as much psychological as practical significance. Darkness creates visual hallucinations and exaggerates phobias. Open flame illumination such as candles must be held to a minimum because it can deplete the oxygen. Battery-operated lights are recommended in the absence of electric lights.

(h) Noise stimulates irritability. Persons in shelter will be instructed by shelter management to remain as quiet as possible. If shift sleeping is practiced, noise will be more of a problem.

(i) Odors from cooking and the toilet will add to body odors. If water is available for bathing, body odors can be largely controlled. Other sources should be controlled and vented.

(j) Anoxia results from oxygen deficiency. The answer is more space or better ventilation. Control or prevention of smoking may be required.

(k) Exercise is necessary for good health and proper body functions. The shelter schedule will provide for daily exercise.

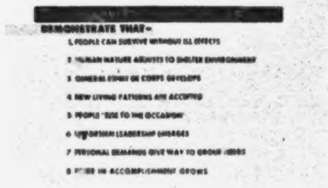
3. General

During the time people must remain inside a community shelter, they must be prepared to face and solve problems without outside assistance. The shelter manager and his staff will provide trained leadership for the community shelter but they will need the cooperation of all occupants. The health, safety and comfort of the group will depend on everyone's working together. Decisions will have to be made, key jobs will have to be filled, and vital programs and activities will have to be carried on. These things cannot be done without each person doing his part.

A spirit of cooperation will make the situation easier and will increase the effectiveness of individual and group efforts.

EXPERIMENTS IN SHELTER LIVING

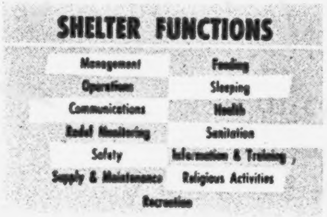
Demonstrate that -



V-89

1. People can survive without ill effects
2. Human nature adjusts to shelter environment.
3. General esprit de corps develops
4. New living patterns are accepted
5. People "Rise to the occasion."
6. Unforseen leadership emerges
7. Personal demands give way to group needs
8. Pride in accomplishment grows

Summary



SHELTER FUNCTIONS

Management
Feeding
Operations
Sleeping
Communications
Health
Radef Monitoring
Sanitation
Safety
Information & Training
Supply & Maintenance
Religious Activities
Recreation

V-90

(Have class members state the shelter function for which they feel most qualified at present. Discuss any function a student might want to be trained to perform.

Point out to the class the many different skills possessed by class members and the advantages to which these could be put in a shelter.)

LESSON PLAN NO. VI

National Shelter Program
(Home Shelters)

V-91

LESSON TITLE: National Shelter Program (Home Shelters)

OBJECTIVES:

1. To show how home shelters are an integral part of the national shelter program.
2. To identify situations where home shelters may offer the best protection available.
3. To acquaint the class with practical home shelter designs.
4. To create an understanding of the last minute actions which can be taken to provide expedient protection from fallout.

REFERENCES:

Personal and Family Survival, SM-3-11, (Revised)
Family Shelter Designs, H-7
Civil Defense 1965, MP-30

TRAINING AIDS:

1. Visual set, Personal and Family Survival, Frames 91-111
2. Projector and screen
3. Film, Shelter on a Quiet Street
4. 16mm projector

A. Introduction

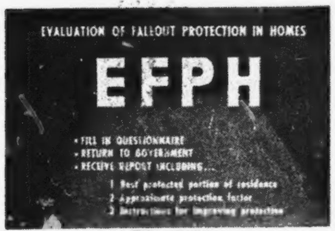
In the last lesson, we learned why an adequate system of community fallout shelters can save more lives for less cost than any other defensive measure if a nuclear attack should occur. We discussed the many distinct advantages of community shelters over home shelters and considered some of the problems of group survival.

This lesson will cover how protection afforded by homes is an integral part of the national shelter program. In many parts of the country there is significant fallout protection in existing homes. Every house provides some degree of protection against fallout radiation. Some have inherent protection which even exceeds the minimum shelter criteria established by the Office of Civil Defense. Sample surveys, conducted for the Office of Civil Defense by the Bureau of Census, indicate that 10 percent of those homes in the United States which have basements have corner areas that afford a protection factor of 40 or better, the minimum shelter criterion. In other homes, it is not too difficult to add some further shielding to upgrade the level of protection provided. This lesson will cover the need for fallout protection in homes, how we can improve the fallout protection in our homes and some expedient actions we might take should an attack occur before we had access to a home or community shelter.

B. Millions of People Must Depend on Home Shelters

1. There are many millions of families living in areas beyond the time-distance limitations for reaching office buildings, schools, community halls, and other structures that have been identified as public fallout shelters.
2. Many families living in surburban, rural, or sparsely settled areas, will find that a shelter in their own home offers the best or perhaps the only protection they can obtain. This is also true of families living in certain residential areas where the population density, particularly at night, exceeds the number of shelter spaces identified in public shelters.
3. The Office of Civil Defense encourages the continued development of home shelters as an integral part of the nationwide system of fallout shelters.
4. Census Bureau data indicate of a national total of 45 million residential dwellings about 25 million homes have basements.

EVALUATION OF FALLOUT PROTECTION IN HOMES PROGRAM



EVALUATION OF FALLOUT PROTECTION IN HOMES

EFPH

- FILL IN QUESTIONNAIRE
- RETURN TO GOVERNMENT
- RECEIVE REPORT INCLUDING...
  1 Best protected portion of residence
  2 Approximate protection factor
  3 Instructions for improving protection

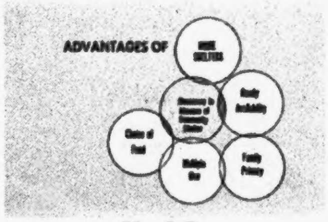
V-92

The Evaluation of Fallout Protection in Homes (EFPH) Program has been developed by the Office of Civil Defense as a possible method for surveying, nationwide, the fallout protection presently existing in home basements. The program is designed to provide all participating householders whose homes have basements, as well as local community shelter planners, with specific fallout protection information and general guidance on how to improve their individual situation. The EFPH program will be implemented a State at a time. Plans are to have a small booklet which will include, along with coded protection factor information, various expedient and permanent shelter designs and a set of emergency instructions.

C. Many Families Will Prefer Home Shelters

1. Even though the advantages of public fallout shelters are many, some occupants of homes with basements will prefer to improve their own shelter. In deciding whether to build a shelter, each family should weigh the merits of such protection as they apply to their own situation.

D. Advantages

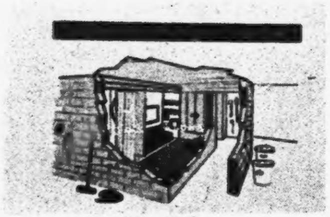


V-93

1. This slide presents some of the advantages of home shelters. Home shelters are available at all times, day or night. They afford family privacy and some assurance that family members will not become separated.

Instead of subsisting on an austere diet of survival crackers and water, families with their own shelters are not so restricted. They can select and store a variety of food in the amounts they desire. Many other elements of normal living can be provided such as blankets, cots, chairs and other personal items.

You can provide additional sheilding for your basement by:



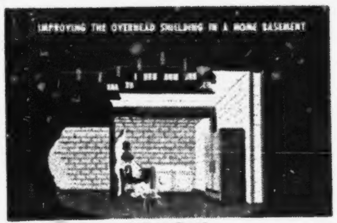
V-94

a. Permanent shelters--By making part of your basement into a shelter area or by building a permanent shelter which might also serve other purposes.

b. Pre-planned shelters--By locating shielding materials so that you can complete a shelter quickly in time of crisis.

c. Improvised shelters--By taking last-minute improvised actions if an emergency actually occurs.

In homes with basements it is normally a simple and inexpensive matter to raise the protection factor to the recommended minimum of 40. Generally, in a home basement the least radiation protection is that provided by the roof and floors overhead against fallout on the roof. The first step in improving the fallout protection in a home with a basement, therefore, is increasing the amount of overhead shielding.


IMPROVING THE OVERHEAD SHIELDING IN A HOME BASEMENT

V-95

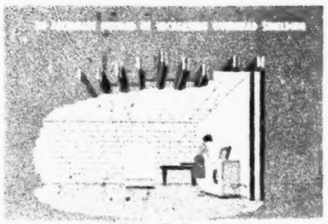
This slide shows permanent improvements which can be made in the fallout radiation shielding of your basement and which will not interfere with its utility or use.

All that is needed is a basement, some basic woodworking skills and approximately $165 for materials.

Since the basement area is almost all below ground level, you can increase the fallout protection by installing bricks or solid concrete blocks between the wood joists in the best corner of your basement.

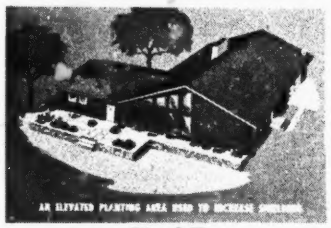
The filler materials are supported by sheets of plywood fastened to the floor joists. A beam and screw jack column may be needed to keep the floor joists from bending too much. A carpenter can tell you if this is needed.

NOTE; For additional details, refer to SM-3-11.



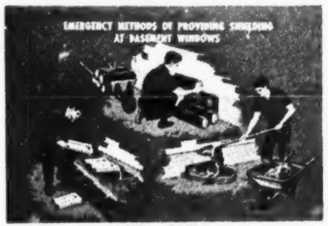
V-96

This type of construction does not require a beam and screw jack column to support the joists. The protected area can be used as a workshop, recreation room, pantry area, laundry room, or part of a family room. With ceiling tile covering the plywood panels, no one would recognize the area as a fallout shelter. Since the objective is to provide as much overhead mass as possible, the heaviest weight of solid brick or block (placed on end if possible) should be used.


AN ELEVATED PLANTING AREA USED TO INCREASE SHIELDING

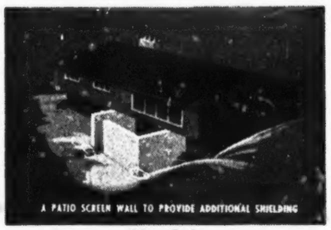
V-97

This slide shows how to increase the shielding of exposed basement walls, if your basement is not completely below-ground. A brick masonry or stone planter box along one or more sides of the house will improve the protection substantially, and will provide an attractive setting for small shrubs and perennials as well. If the partially exposed wall is at the rear or side of the house, an elevated garden could be built with masonry retaining walls.


EMERGENCY METHODS OF PROVIDING SHIELDING
AT BASEMENT WINDOWS

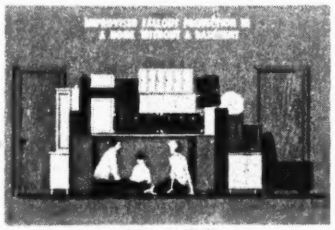
V-98

If the partially exposed walls have windows, these can still be used provided window wells within the planter box or elevated garden area are adequately covered. The wells can be filled with earth or covered with concrete blocks during an emergency to provide additional shielding.


A PATIO SCREEN WALL TO PROVIDE ADDITIONAL SHIELDING

V-99

Enclosing your patio area with a solid masonry screen wall will give you privacy for lounging and cookouts and will provide a barrier shield to increase the protection factor in the basement area.


IMPROVISED FALLOUT PROTECTION IN
A HOME WITHOUT A BASEMENT

V-100

To improvise fallout protection inside your home if you do not have a basement, first select the area having the greatest inherent fallout protection. This will normally be in a hallway or room near the center of the ground floor. In this area, put the largest and strongest table or similar piece of furniture that will fit. By using other furniture and doors already available, it may be possible to improvise such a table. Then put as much heavy furniture, books, magazines, boxes or drawers of sand or earth, and other heavy materials as you safely can on top of and around the table.

2. Many families may desire to build a shelter affording greater protection. Such a shelter can have a multiple use, most frequently serving as a den, hobby or extra guest room.

   NOTE: (Ask class members to suggest other advantages and discuss.)

E. Minimum Characteristics

Home shelters, properly constructed, should have certain characteristics.

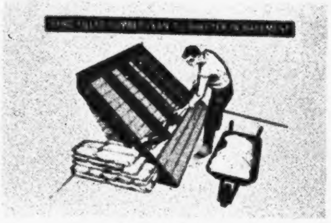
1. Fallout protection factor - shelters should provide a factor not less than 40.
2. Space - shelter space should be large enough to provide ventilitation for the number of people who will occupy it.
3. Fire resistance - shelters should provide considerable resistance to external fire hazards.
4. Drainage - It is important to keep the shelter dry. Certain types of shelters may require special drainage systems.
5. Lighting - a source of continuous low-level lighting is desirable, with a means of providing brighter light occassionally. It is possible that normal electric lighting can be used. A flashlight with a fresh supply of batteries or other appropriate equipment should be available in case of power failure. Candles, lanterns, and other flame-type lights consume oxygen and should be used with caution.
6. Heating - a heating unit may not be essential for a home shelter since the body heat given off by the occupants will help to warm the shelter. If a heater is desired, it should be electric even though it might be useless if electric power is not available. Fuel-burning space heaters consume oxygen, release dangerous carbon monoxide, and should not be used.

NOTE: Show the film, Shelter on a Quiet Street, particularly if the class is in a community where home basements are common. Discuss the film and answer any questions class members may have. (Use visuals on home shelter designs that are appropriate to the needs of the class being taught.)

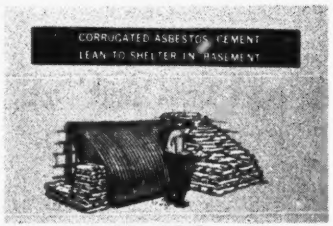
F. Many Kinds of Home Shelters

1. The information required to construct family fallout shelters is available from local Civil Defense officials

NOTE: ("Family Shelter Designs," (OCD H-7) or a similar pamphlet may be distributed at this time.)

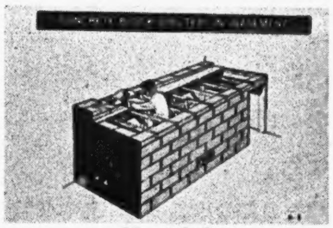

V-101

The advantages of a basement sand-filled lumber lean-to shelter of this type are low cost, ease of construction, and ready availability of material. This shelter for three persons would cost about $75 and last for 10 to 15 years in a dry basement.

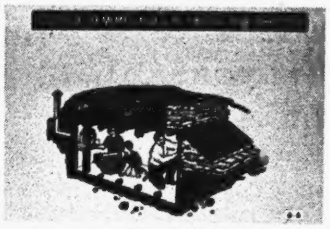


V-102

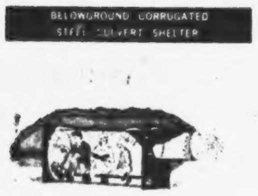
A corrugated asbestos-cement lean-to shelter of this type allows slightly more space for three occupants at a cost of about $125. Depending on the amount of humidity in the basement, it could be expected to last from 10 to 20 years.


V-103

This simple basement concrete block shelter design provides 260 cubic feet of space, enough for four persons. The cost for the basic shelter is estimated at $75 and its life expectancy would be about the same as most types of houses.

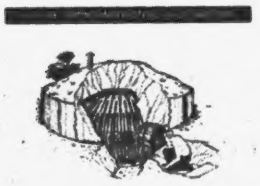

V-104

For about the same cost, a person could build this semimounded plywood box shelter if space were available outside the house. Ventilation and lighting would increase the total cost but such a shelter would have a higher protection factor than the others already discussed and afford greater protection against blast overpressure.



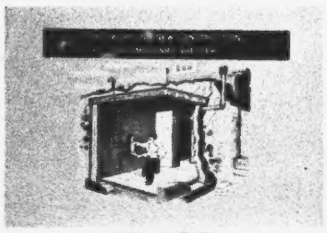
V-105

The principal advantage of this below ground corrugated steel culvert shelter is its availability as a prefabricated unit ready for lowering into an excavation. Under most soil conditions, this shelter, costing about $150 delivered, would last at least ten years.



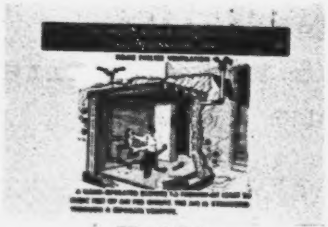
V-106

This shelter is of the prefabricated type available for about $175, not including installation or delivery. With prescribed thickness of earth covering and proper shielding of the entranceway it provides a protection factor of about 500.



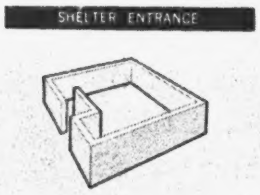
V-107

This belowground shelter is located outside a house and is reached from the basement. Because of the headroom and interior space, this shelter can be used for other purposes. Materials and equipment cost are estimated at $300 to $350. Labor cost should run between $250 and $300 when performed as part of new house construction.



V-108

This slide illustrates how a hand-operated blower can furnish a flow of air through an underground shelter. To the left, there is 3-inch air intake pipe extending about 2 feet above the ground. It has a mushroom-type cap and a screen to keep fallout particles from being drawn into the shelter. The intake pipe should be placed as far from the house as possible. The exhaust pipe shown in the upper right side of the slide also has a mushroom-type cap.



V-109

These ventilation precautions are not necessary for most basement shelters since air is circulated by convection currents through an open shelter entrance like the one shown on this slide, and low vents in the inside walls.

The baffle wall opposite the entrance serves an important function in basement shelters. Since radiation from fallout travels in straight lines, the right angle turn of the baffle wall keeps most radiation from entering the shelter.

G. Supplies and Equipment

Home fallout shelters should be provisioned with supplies sufficient to last at least two weeks.

NOTE: Have students develop a list to include amounts of essential home shelter supplies using the following broad categories as guidance:

Water
Food
Communication Equipment
First Aid and Medical Supplies
Radiation Detection Instruments
Clothing and Bedding
Sanitary Supplies
Garbage and Rubbish Disposal Equipment
Rescue Tools
Special Supplies (for individuals with health or medical problems)
Miscellaneous supplies or nice-to-have supplies

H. Last Minute Improvised Measures

NOTE: Have members of the class suggest actions that could be taken by occupants of a house without a shelter, and none to go to, when a warning of an attack is received. Develop a list on the chalkboard.

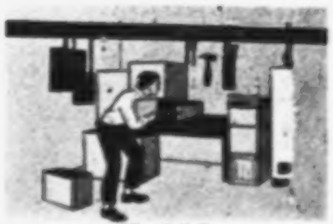
I. Protection Guidelines

1. Some general guidelines for last minute fallout protection at home are:

a. A basement is usually better than aboveground floors, particularly in private residences. (In large commercial or civil buildings, however, the central areas of middle floors could offer good protection.)
b. A corner of a basement that is below ground level is better than the center of the basement.
c. On aboveground floors, an improvised shelter should be situated away from outside walls.
d. An improvised shelter should be small. The shielding mass should be concentrated immediately around and above the occupant to conserve construction time and materials.
e. Stay away from windows and outside doorways because these are weak points in the fallout shield. Also, windows could be shattered, even though they are located many miles beyond the severe blast damage area of a nuclear explosion.

J. Improvised Shelter

1. It takes time to build a permanent shelter, but, if the warning of an impending nuclear attack comes today or tomorrow, there may still be time to improvise a shelter. In any event, a family which does not plan to build a home shelter should survey their home and decide which room is most completely surrounded by thick walls and ceilings. After identifying the zone of best protection in this room, make plans to add temporary shielding materials around this area, especially overhead. For example, a table covered with as many concrete blocks, containers of earth, or other heavy objects as possible, would provide emergency shielding. Even stacks of books, magazines, or newspapers help to provide density to reduce radiation.


V-110

This slide shows a man improvising such a refuge in the corner of his basement. Filling basement wells with dirt will improve his margin of safety.

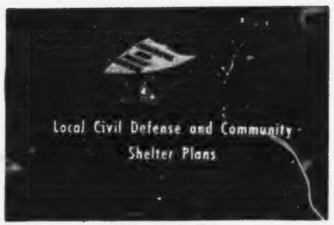
It should be remembered that the walls of an inner room in a building will provide more shielding than the outer walls alone. If no provisions for fallout protection have been made in the structure, the occupants should move quickly to the innermost part of the building. Basement areas provide better radiation shielding than inner, aboveground areas.

V-111

If there is no basement, a shelter can be improvised by digging a trench in the backyard and covering it with doors, plus at least one foot of earth. Remember, improvised shelters are far from ideal. They would be uncomfortable. Time might or might not be available to prepare one. But if a shelter had not previously been prepared, and a public shelter is not near, an improvised shelter could save life.

During a period of increasing international tension people should improvise the best shelter possible. If they had not already constructed a fallout shelter, a great deal of protection could be added even in the hours which might elapse in many areas between the time of bursts and the arrival of fallout.

LESSON PLAN NO. VII



Local Civil Defense and Community Shelter Plans

V-112

LESSON TITLE: Local Civil Defense and Community Shelter Plans

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OBJECTIVES:

1. To develop an awareness of the civil defense activities and planning going on in their community.
2. To emphasize that the effectiveness of the total civil defense program depends largely on local civil defense readiness.
3. To motivate class members to seek and accept personal and community civil defense responsibilities.

REFERENCES:

Personal and Family Survival, SM-3-11, (Revised)
Civil Defense 1965, MP-30
Federal Civil Defense Guide, Part B, Chapter 3, Appendix 2
Information made available by local Civil Defense officials

TRAINING AIDS:

As required by method of presentation

NOTE TO INSTRUCTOR:

It is strongly recommended that a local civil defense official be invited to participate in this session of the course. A resource person such as this can provide first hand information on the civil defense program and plans in that particular community. His presence and comments will demonstrate to the class his interest in the Civil Defense Adult Education Program. At the same time he will have an opportunity to encourage further participation in local civil defense activities.

Should a representative of the local civil defense organization not be available to participate in this class session, it will be necessary for the instructor to prepare his own presentation.

In either case, it is recommended that the instructor meet with a local civil defense official prior to teaching the lesson.

To follow is a brief, non-technical description of Community Shelter Planning. This may be used as background material by the instructor or a local civil defense official in preparing his presentation.

COMMUNITY SHELTER PLANNING

The Community Shelter Planning program, by basing local preparedness on the most effective use of existing fallout shelter, represents the next logical step to shelter surveys. It will therefore constitute the most important program inaugurated by OCD since the civil defense mission was assigned to DOD in 1961 and the shelter survey was commenced.

CSP will tie together Federal, State, and local programs and plans in concrete fashion. CSPs will provide a central orienting focus for OCD programs to survey smaller structures, to identify the fallout protection existing in homes, and to bring more spaces into the shelter inventory by providing Packaged Ventialtion Kits. The emergency plans of police departments and of other forces of local government will be based on making the most efficient use of fallout shelter locally available; similarly, each citizen will know where to go and what to do to maximize his chances of survival.

Community Shelter Planning aims primarily at matching the people in each locality in the country with space providing protection against fallout, so as to maximize the number of lives saved in case of nuclear attack. The most important single result of completing a CSP project in a locality is that each citizen will know where to go and what to do should an attack occur. People in areas served by public shelters will know to which shelter to go. People in areas where public shelter is not available will know that their best chance for survival lies in going to the best-protected part of their home and improving the protection existing there, by improvising additional protection against fallout.

The foregoing information will be given to the citizens of the CSP area in the form of maps and instructions, prepared as part of the CSP project. It would be repeated by re-publication in a period of crisis, time permitting, using information materials developed during the CSP project.

In addition, the CSP process pinpoints deficits of public fallout shelter by both amount and geographical location. This allows localities, working with OCD, to focus efforts to secure more shelter in the deficit areas. These efforts include, for example, requesting Packaged Ventilation Kits to increase the capacity of unventilated space in public shelters, and undertaking programs to encourage the incorporation of shelter space in new public and private buildings by the use of low-cost "slanting" techniques in design. Identifying shelter deficits with precision will also permit OCD to prepare accurately-based national programs to relieve deficits.

Finally, the CSP process includes updating local CD emergency plans to base them upon CSP shelter allocation plans. This means relating all emergency activities of state and local government forces to fallout shelter, during the increased readiness, warning, in-shelter and shelter-emergence periods.

Thus, the members of a local police department would be assigned to post shelter signs at previously unmarked buildings during an Increased Readiness period, to help the people move to shelters during the warning period, and to maintain law and order in shelters during the period of shelter occupancy and outdoors in the shelter-emergency period.

In short, the CSP provides for making the best use possible of existing shelter, in case of nuclear attack at any given time, and for attaining in an orderly way, and at least cost, the goal of a shelter space for each citizen. The CSP is therefore an integrating focus for all OCD and State-local civil defense programs and activities.

The CSP process as outlined above has been through intensive research, development and field test phases. Shelter allocation techniques were first developed in 1962-63 by OCD Research projects in Boston, Lincoln, and San Diego. These techniques were applied in Montgomery County, Maryland and in the cities participating in a CSP development project, in 1963-64. This project made it clear that the skills of city planning professionals were required to allocate people to existing public shelters.

Accordingly, OCD undertook an expanded CSP field-test in 1964-65. This project provided full Federal funding for work by local city planners, to produce shelter allocation plans in at least one city in each State. In addition, the project produced drafts of CSP guidance and instructional materials, as well as a recommended management system for national CSP program.

OCD is deploying this as a national program. All parts of the country over a period of approximately three years, from mid-FY 1966 through FY 1969 will be covered by the national program.

This will be done in two ways: (1) In the approximately 1500 counties with substantial amounts of shelter, and hence with complex population-shelter situations, directly-funded contracts will be negotiated with local metropolitan area planning commissions or other governmental or quasi-government planning entities. These contracts will provide for the production of local CSPs through work by local city planners, working closely with local governments and civil defense directors. The local contracts will be negotiated by Corps of Engineers or Bureau of Yards and Docks district offices, based on a Work Order from OCD.

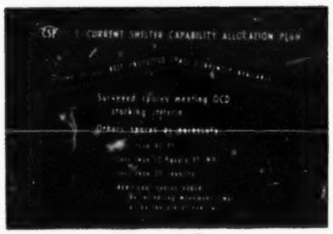
(2) In the remaining counties, professional city planner assistance will be provided by State CSP Officers hired under contracts to be negotiated between OCD and each of the 50 States.

The CSP program will create important changes in the direction, thrust and nature of the Federal-State-local civil defense program. Probably the most significant change is that for the first time, civil defense will be personalized for each citizen, in that the CSP process will allow his local government to answer specifically these questions, "Where do I go? and "What do I do?" in case of nuclear attack. He will also be told what governments at all levels are doing to alleviate shelter deficits. From the initial reaction in those cities which have published such information this appears to make sense to the citizens and is welcomed by them.

Localities will be required to distribute this information to their citizens, to remain eligible for OCD financial assistance programs; (OCD will provide 100 percent funding for the costs of printing and distribution.) Also, all localities will be required to have completed a CSP or to have one in process by June 1968. Thus, OCD matching funds and other aids will be tied directly to CSP participation, which will provide a sounder and more coherent basis for OCD assistance than has existed in the past.

CSPs will also focus civil defense emergency planning on practical and concrete operations to maximize survival, all centered on the use of available fallout shelter. The emergency plans of local police and fire departments, for example, will be based on the use of shelter and on protecting people in shelters, rather than on abstract concepts of "maintaining law and order" or of "fighting fire," as in the past. Similarly, state-level plans will be closely tied to the concrete problems of preserving the lives of people in shelters in localities throughout the State, rather than being theoretical in approach.

All Community Shelter Plans developed under the National Community Shelter Planning Program will include six steps.



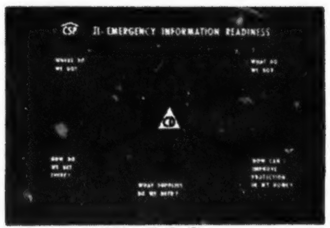
CSP I-CURRENT SHELTER CAPABILITY ALLOCATION PLAN

Surveyed spaces meeting OCD stocking criteria

V-113

Step I Current shelter capability allocation. plan. The Step I allocation plan is required to make use of the shelter capability of the community, i.e., the best protected space currently available, in order to provide the best protection possible for the entire population. This includes the use, where and as necessary, of all space located by the National Fallout Shelter Survey and the Smaller Structures Survey, and through the Evaluation of Fallout Protection in Homes.

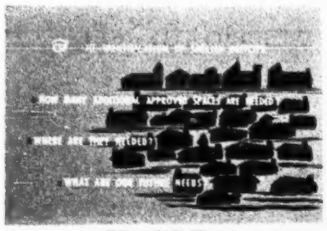
Surveyed shelters with a protection factor less than 40 will be used temporarily where and as necessary. Departure from the 10 square foot space-per-person planning factor, where feasible, and movement times exceeding planning estimates by a reasonable amount will be employed as necessary. Where necessary, plans will include provisions for individuals to move by vehicle to shelter.



CSP II-EMERGENCY INFORMATION READINESS

V-114

Step II Emergency information readiness. Step II of each Community Shelter Plan requires that the local government be prepared to advise the people on where to go and what to do in case of nuclear attack. This includes information on the location of all available public shelters, and on routes to take to these shelters, as well as information for people for whom there is no public shelter available under the Step I plan, e.g., on how to improve the fallout protection afforded by their homes.



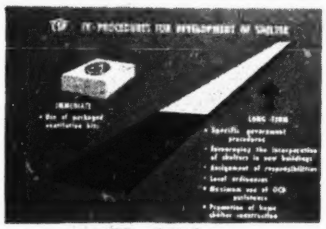
HOW MANY ADDITIONAL APPROVED SPACES ARE NEEDED?

WHERE ARE THEY NEEDED?

WHAT ARE OUR FUTURE NEEDS?

V-115

Step III Identification of shelter deficits. The purpose of Step III is to identify shelter deficits on a uniform basis throughout the country, by quantity and by geographical location. This includes both present deficits and anticipated future deficits, taking into consideration shelter expected to be added by new construction or subtracted by demolition, as well as population change predicted in local urban planning.



V-116

Step IV Procedures for development of shelter. Step IV includes both immediate and long-term local government action to alleviate the present and anticipated future shelter deficits identified in Step III, using all means available or which may become available.

The immediate action is to prepare a plan for the use of Packaged Ventilation Kits, based on the use of all ventilatable space in Community Shelter Planning area which is needed.

The long-term program calls for specific local government procedures that will encourage incorporation of shelter in new public and private buildings constructed in shelter deficit areas. Specific responsibilities are assigned to local government agencies and departments, and a recommended local ordinance on incorporating shelter in new public buildings is prepared.

Since most communities have a shelter deficit, every means of increasing shelter spaces should be explored. Wherever new buildings are being planned, special consideration should be given to provision of shelter capability. This is especially true in the planning and construction of new school buildings and in modernization of existing school buildings.

Among the reasons why special attention should be given to school buildings are:

1. They provide the most convenient and controllable shelter areas for pupils during school hours.
2. They are, in most cases, centrally and conveniently located with respect to places of residence. Thus, they provide convenient shelter for both pupils and parents at all times whether or not schools are in session.
3. Schools are staffed by persons experienced in controlling people. Thus, they have a "built-in" shelter management capability.
4. Schools are generally provided with facilities, equipment, and supplies which make them especially desirable

and usable for shelter occupancy. Toilets, feeding facilities, and food supplies are among the most important of these.

5. The extensiveness of the school construction program--elementary, secondary, vocational, technical, and collegiate--makes this an especially fertile source for rapid reduction of shelter deficits.

Public resistance to the incorporation of shelter capability into school construction has been based, in large degree, on unwillingness of the school district to accept large additional costs. Studies and research have now revealed that shelter protection can be provided in schools at little or no cost if provision is made for it at the time the building is planned. The technique for doing this is called "slanting."

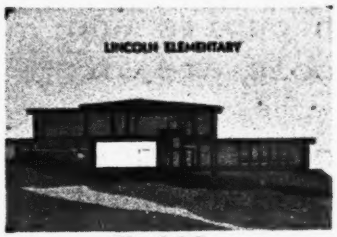
Slanting is defined as the incorporation, with little or no extra cost and without reduction in efficiency of certain architectural and engineering features into all new structures, to protect personnel from fallout gamma radiation in event of an emergency. Slanting adds the protective function to the other elements normally considered in the design of structures.

Examples of slanting techniques which can be applied to school construction and to other buildings are:

REDUCE
WINDOW
AREA

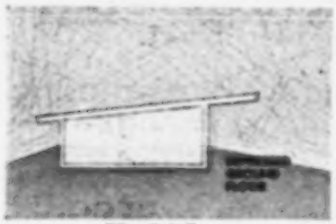
V-117

1. Location and quantity of window areas. Raising of the sills or reduction of the number of area of windows can contribute to improvement of protection.



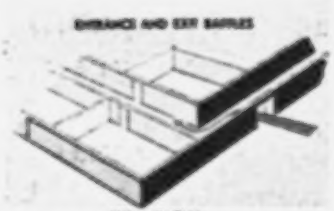
V-118

2. Site conditions. Structures can be located on the site to take advantage of shielding from adjacent structures or topography of the land. Retaining walls, planters, overhangs or grading of slopes away from the structure also help to minimize the effect of radiation from fallout on the ground.



V-119

3. **Basement.** Depressing the ground floor partially or completely belowgrade adds substantially to the protection.



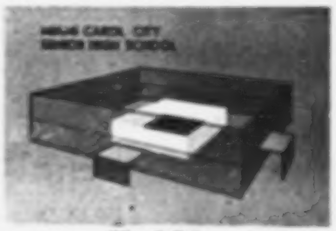
V-120

4. **Entrances and exits.** Location of doorways and stairways in such a manner that walls will serve as baffles to cut off direct entry of ground radiation can improve the protection factor.

5. **Partitions.** Proper location of interior walls can improve the protection in a similar manner.

6. **Solid walls.** Hollow walls can be filled with sand or other low cost materials to provide additional shielding.

7. **Floors and roofs.** Selection of the proper floor and roof materials can also provide significant additional shielding.



V-121

8. **Architectural arrangement.** Design which provides a protected core area is an effective shielding device.

These and other design techniques can be readily applied by architects and engineers who have been trained to do so. Several thousand persons representing all States and many areas in each State have attended OCD sponsored courses providing this training. A directory containing the names and locations of such persons is available from local and State Civil Defense Directors.

The long-term program also includes plans for making full use of assistance offered under the Office of Civil Defense Architect-Engineer Professional Development Services.

V-122

Step V Directive(s) for updating local civil defense emergency plans.

Step V requires the community shelter planning project staff to prepare a directive for updating local civil defense emergency plans to base them on the Step I shelter allocation plan. The purpose is to develop the local capability needed to make the shelter allocation plan work. The functional areas to be covered by the Step V directive include warning, shelter organization and staffing, radiological defense, fire services, maintenance of law and order, communications, emergency operating center staffing and procedures, Emergency Broadcast System, military support, increased readiness measures, emergency health and welfare services, and others as required.

V-123

Step VI Official adoption or approval of Community Shelter Plan.

Step VI requires local official review of Steps I to V, resulting in consideration of whatever local legislative or executive action is required under State statute or local ordinance to officially adopt or approve the Community Shelter Plan.

LESSON PLAN NO. VIII

Survival on the Farm

V-124

LESSON TITLE: Survival on the Farm

OBJECTIVES:

1. To develop a better understanding of the problems faced by families in rural areas. To provide information needed to prepare for and survive under nuclear attack.

REFERENCES:

Personal and Family Survival, SM-3-11, (Revised)
Food and Agriculture Against Nuclear Attack, Handbook #234 USDA
Appropriate Publications of the U. S. Department of Agriculture, to be obtained from the local Extension Agent or USDA Representative

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TRAINING AIDS:

1. Visual set - Personal and Family Survival, Frames 124-138
2. Projector and screen

A. Introduction

1. The problems of survival on the farm are, in many ways more complex than those faced by a city or town resident. The urban dweller is able to rely more heavily on local government resources. Farmers and their families are necessarily responsible for a much larger part of their own protection. They are also responsible for their animals and crops.

2. Industry and business must be protected to the extent possible in order that essential production be quickly reestablished. Likewise, it is essential not only that farmers and their families survive, but that they continue to produce food and other necessary products.
3. This lesson should be of interest to all, whether we live in metropolitan or rural areas, because we are all concerned about the availability of food after a nuclear attack. During this session we shall consider the effects of radioactive fallout on livestock and farm crops and the prospects of resuming farm food production in a post attack period. Much of the material we shall discuss can be used by those actively engaged in farming to assist them in meeting the somewhat different problems they may face. Those of us who depend on the farmer for continuing the production of suitable food will learn what can be done and what is being done to assure that we have an ample and healthful food supply.
4. It is important for all of us to know that the continuing production of food is not a forgotten part of civil defense. By Executive Order, the President of the United States has assigned to the U. S. Department of Agriculture (USDA) responsibilities for the protection of food and agriculture resources. Also the USDA representatives in each county, working with other local civil defense officials, are responsible, following an attack, for assisting the farmer in reinstituting agricultural activities as soon as possible.

B. Farm Problems

1. Warning

Because most farms are far from community centers and are often widely separated, warning that an attack is likely to occur, or has occurred in some part of the country, is a special problem in rural areas. Even powerful sirens and horns would not have the necessary range to get warning to all who live in rural areas. In many areas warning systems will have to be improvised. These may include the use of:

a. telephones
b. radio (EBS)

NOTE: Discuss local problems and solutions.

2. Farm Shelter Problem

a. Many farm families live far away from population centers and cannot make use of community shelters. Therefore, family shelters are needed. Good shelter, conveniently located, is particularly important for the farmer because he may have to work in fallout radiation areas. Good shelters are necessary to keep the exposure of occupants to a minimum.

V-125

b. Shelters on the farm are similar in principle to family shelters built elsewhere. However, many variations are possible. For example, existing structures such as a root cellar or "cyclone cellar" may be readily adaptable to use as a fallout shelter. Where early care of livestock would be required it would be well to have the shelter close to or connected with the protected area for housing livestock.

The requirements for providing emergency shelter supplies, including food and water, are also similar to those for other family shelters. However, if the farmer is active in the care of livestock, he would probably require more food and water than persons remaining quietly in shelter.

3. Emergency Power

V-126

Many farms are so greatly dependent upon electricity that even a brief loss of commercial power can cause serious problems. A tractor may provide a source of mechanical power. An item of emergency equipment to be considered is a gasoline or diesel powered electric generator. If provided, it should supply 60 cycle, a.c. current at a voltage or voltages matching those required for the most essential equipment. Its capacity must be adequate to handle the essential load. Such equipment might be located in a shielded compartment near the shelter with the exhaust vented to the outside. Gasoline storage should be at a safe distance and its capacity should be sufficient to last for an extended period of time.

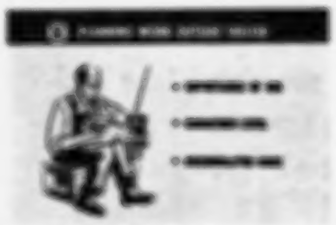
4. Fire

V-127

Disastrous fires could follow a nuclear attack. To meet this problem, the Forest Service of the USDA has formulated plans in cooperation with Federal, State, and local agencies to assist the farmer. Efforts of the individual farmer may serve to protect the community as well as himself. For example: A fire lane around a farm, forest or grain field, will not only protect the owner's property in peace or emergency but also contribute to the local fire-defense effort.

Good housekeeping practices around the farm, the home, barn, and other buildings will greatly reduce the fire hazard. These practices are to help prevent fires and to help keep fires from spreading. The use of herbicides to kill vegetation around key buildings is an excellent method of fire prevention. One major problem in fire fighting on the farm may be an inadequate water supply. Ponds, lakes, or wells can be utilized if suitable hoses and pumps are available. Another need is for adequate fire reporting. Since localities differ, each must work out its own system. The organization of neighborhood fire fighting teams for mutual self help is highly recommended.

5. Work Schedules in Fallout Areas


V-128

The farmer is an important emergency worker. He may have to accept some risks in assuring that he will be able to continue agricultural production. However, he should make every reasonable effort to keep radiation exposure to the lowest practical limit.

Upon attack, a farmer must first provide for his own safety and that of his family. To do this he may not be able to immediately take care of his livestock, crops, and land. Information concerning local fallout hazards will be furnished by local civil defense authorities. However, radiation dose rates can vary a great deal over relatively short distances and will have a direct effect on the farmer while performing tasks under varying degrees of protection. For these reasons, a farmer may wish to own radiation measuring instruments so that he may determine radiation levels and control individual exposures. In leaving the shelter to provide essential care for animals or crops the farmer should consider the importance of the task to be performed in relation to the risk in terms of the radiation dose he will receive. The farmer must realize that the hazard decreases with the passage of time, so that tasks that can be put off to a later time will involve less hazard. When advised by local officials that working outdoors will involve little risk, precaution should be taken against contamination by radioactive particles. The farmer should wear clothing such as hat, coat, boots and gloves which will reduce the contact of fallout particles with his body.

C. Soil and Crops

1. Huge areas of crop and rangeland could be contaminated by fallout. This contamination presents several problems:
    a. The problem of personal exposure of agricultural workers. This has already been discussed.
    b. The continued production of food which will be safe for consumption.
    c. Providing safe food for livestock.

Whether radioactive materials are deposited on the edible portions of plants or are absorbed through the roots of the plants, they constitute a potential hazard to human beings and animals.

V-129

2. Growing vegetables that are exposed to fallout may become contaminated. Leaves, pods, and fruits are immediately contaminated by the radioactive particles which adhere to them. (Roots and tubers absorb little contamination from fallout before it is mixed with the soil; therefore, they should be eaten first in preference to any other

fresh vegetables. Underground vegetables that have come in contact with contaminated surface soil should be washed and peeled before using.

3. Foods ready for harvest at the time of fallout might be lost because of the danger involved in harvesting them. However, many kinds of food nearing maturity could be harvested and used. Fruit and vegetables growing above ground could be washed, removing most of the fallout particles. Salvage of some leafy vegetables would not be practicable, but removal of the outer leaves of cabbage and head lettuce would remove the fallout. Root vegetables such as potatoes, carrots, beets, etc., would be edible if washed and peeled before using.

   Monitoring of grain would be required before use. Threshing of grain, and cleaning processes before milling, are designed to remove dust and can be expected to remove most of the fallout particles.

4. If unfit for human use, grain would probably be suitable for industrial use or feed for poultry and livestock since the more harmful radioactive materials would tend to concentrate in the animals' bones and vital organs which are not or need not be eaten.

   (NOTE TO INSTRUCTOR: For a more detailed explanation of food cycle and Strontium effect, see page 19, Agricultural Handbook #234)

5. Soil can be treated to reduce the fallout hazard after external radiation levels are low enough to go outdoors and work. Cultivation will help reduce external radiation hazards. Fallout can be removed from selected small land areas by scraping off a few inches of soil.

V-130

Liming can reduce the assimilation of certain radioactive materials. The leaching of soil or deep plowing have also been suggested as decontamination measures but so far have not been proven practical. Decontamination should be undertaken only under expert direction since the workers would be exposed to radiation hazards.

6. It would be impractical to decontaminate rangeland and croplands which are not intensively used. However, if fallout is very light, pasture can be used immediately. Acid soils should be limed before being reseeded.

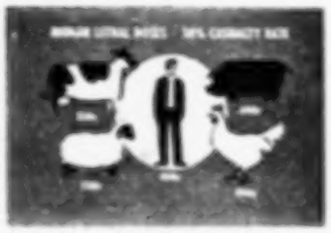
7. Existing growths of alfalfa and other forage crops might not be usable because of radiation hazard. Radioactivity would be less in subsequent growths.

8. If land is heavily contaminated, it may be necessary to grow only crops that do not absorb large amounts of radioactive materials from the soil. Potatoes would be a suitable substitute crop in highly radioactive soils because they would absorb very little radioactive strontium compared with leafy vegetables. Corn and other cereal grains, sugar crops, fruits and oil crops are among those which may be substituted on heavily contaminated land.

9. Non-food crops could be substituted for food or feed crops. Cotton, fiber, castorbeans, timber or other such crops might be considered.

D. Livestock and Fallout Problem

1. Livestock Protection Plan

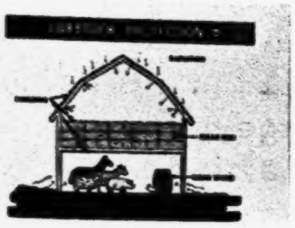


V-131

Not all animals are equally affected by radiation. Here are some doses which would kill 50% of various animals. Note that man withstands about the same dose as sheep and hogs. Chickens are the most resistant and could be one of the best sources of animal protein food following an attack.

Experimental findings, however, show great differences among individuals of all species. Just as some cows give more milk than others, certain cows can also stand more radiation than others. This is true with all species--man and livestock.

a. Like men, animals are injured by radiation from fallout, and where practicable should be given protection. A livestock and animal protection plan should be designed to save the most valuable animals first.



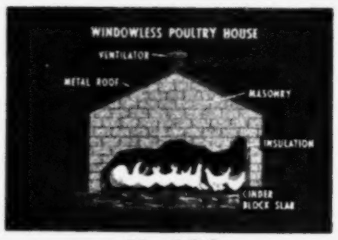
V-132

b. The farmer should place best breeding stock, choice milk producers, and best layers in buildings such as potato cellars or barn basements that provide the best shelter. He can then fill his other farm buildings with less valuable animals.

Several feet of hay in an overhead loft would help protect livestock from fallout. Hay stacked around the sides and ends of a barn will improve protection. A barn basement could provide considerable protection, particularly if earth fill is placed against exposed walls. Doors could be quickly shielded with bales of hay or with sacks of earth or grain.

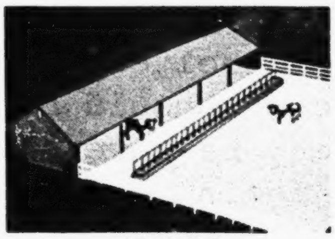
c. Part of the livestock may necessarily be left unprotected. In many areas, subjected to only moderate fallout, part or all would survive.

d. The shelter requirements for other animals is basically the same as for cattle. Measures for protecting poultry are relatively simple. Flocks housed in concrete buildings would be better protected than those housed in wooden buildings. Radioactive materials might show up in the eggs if the hens eat contaminated feed. But most of the radioactive strontium will collect in the shells; very little will collect in the yolk and in the white.



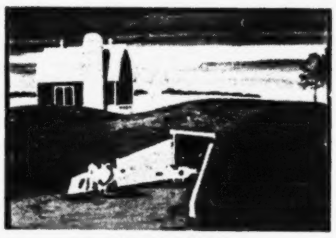
V-133

2. Livestock Shelter
   a. Livestock housed in barns and other farm buildings during periods of fallout stand a better chance of surviving the effects of radiation than those that are not sheltered. Animals should be moved indoors as soon as possible and uncontaminated feed and water should be supplied if possible.



V-134

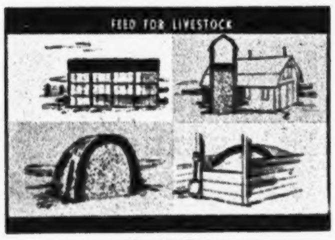
b. If adequate facilities for housing livestock are not available, livestock should be near farm buildings or in a small drylot. Dairy cattle should be put under cover first. A reasonably well built barn or other building prevents fallout from settling on the animals' bodies and reduces the intensity of external radiation reaching the animal; the eating of contaminated feed is also controlled.



V-135

c. Many existing farm structures provide some protection and their use in an emergency could make the difference between the survival and the loss of livestock. The protection provided by existing structures can often be materially improved at nominal cost. A combination trench-type silo and shelter can provide good protection and ready access to feed at relatively low cost.

3. Livestock Feed



V-136

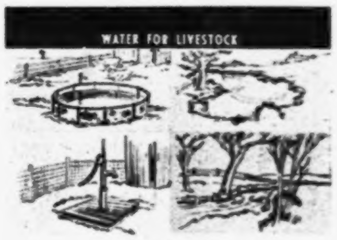
a. Of course, livestock in barns and shelters must have food and water during the shelter period. Stored hay, feed, silage, grain, and concentrates, should be reasonably free from fallout. If the particles settle on any feeds, they will contaminate only the outer portions. Such feeds may be decontaminated by removing the outer layers or bags, so that the remaining feed could be used.

Fallout, if any, in a silo would be concentrated mostly in the upper 12 inches of silage.

b. Farmers will be notified if local civil defense authorities consider forage that is growing in an area to be harmful. However, this advice might come too late. When in doubt, it is best to house the livestock without giving them access to forage. Because of radioactive decay, contaminated feed may become safe to use after a period of storage.

c. Radioactive materials can be concentrated in milk, which will be a very critical product during an emergency. Cows should have preferred shelter and clean feed and water. If possible, they should be milked before fallout arrives as it may be several days later before they can be milked again. If practicable, cows and suckling calves should be placed together; the calves can suckle and reduce the discomfort of full udders. Amounts of water and concentrated feed should be reduced to maintenance levels.

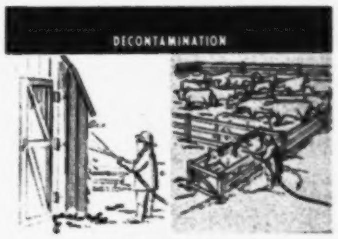
4. Livestock Water



V-137

Water from a covered well, tank, cistern, or from a freely running spring should be safe. River water is more likely to be contaminated. However, most of the fallout will be removed if it is filtered through sand or if it is allowed to settle. Pond water will likely be safe after a few days. To prevent contamination from fallout, do not add water to covered tanks, except water from a properly protected well or spring, until the water originally present has been used.

5. Decontamination of Livestock and Farm Buildings



V-138

If there is fallout on the animals' skins, some of the radioactive material can be washed off with water. In handling animals, the farmer's body should be fully covered including hats, gloves, and boots. Cleaning or disinfecting buildings will not destroy radioactivity. However, cleaning can be useful in moving radioactive materials to a place where radiation will be less harmful.

E. Livestock as Food Source

Meat, dairy, and poultry products from animals that have been adequately protected should be wholesome. Even if livestock had been exposed, the meat could be eaten if the animal shows no sign of illness and adequate precautions are taken to avoid contaminating the meat while butchering.

The USDA Meat Inspection Division has developed procedures to be used to assure wholesome commercial supplies of meat.

F. Milk as Food Source

Milk produced by cattle grazing on contaminated grass is likely to contain sufficient amounts of radioactive substances to be hazardous for consumption by humans, particularly children. Some of the milk could be used if the radioactive intensity of the milk is not too great. There should be no destruction or disposal of contaminated milk. It can be processed into products such as butter, cheese, and powdered milk. These products can be stored to allow time for radioactive decay.

G. Government Assistance

In preparing for a national emergency, the farmer may obtain guidance and assistance from his USDA County Defense Board on emergency farming practices. Trained monitors will aid in detecting and measuring contamination of land, crops, water, and animals.

H. Last minute actions which the farmer may take are:

1. Confine all livestock and animals, preferably in buildings, or at least a dry lot.
2. Bring feed into buildings, or cover with tarpaulin if left outdoors.
3. Store as much water as possible for livestock if normal sources of water are subject to contamination. Cover wells, rain barrels, and tanks.
4. Place decontamination equipment including tractor with scraper or plow where it will be handy for use.

LESSON PLAN NO. IX

V-139

LESSON TITLE: Individual and Family Preparedness for Shelter Living

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OBJECTIVES:

1. To emphasize individual and family responsibility to plan for shelter living.
2. To assist class members in the development of an effective family survival plan.
3. To familiarize class members with essential survival supplies which will make shelter living more tolerable.

REFERENCES:

1. Personal and Family Survival, SM-3-11, (Revised)
2. IIG-1 Guide for Community Fallout Shelter Management, 1963. pp. 2-1 to 2-4; 3-1, 3-2, 3-5 to 3-9; 5-1 to 5-6; 7-1 to 7-6; 9-1 to 10-11; Appendix B
3. H-1, Emergency Sanitation at Home, 1961. All
4. HGB-77, Family Food Stockpile for Survival, 1961. All
5. USDA-2107, Radioactive Fallout on the Farm, 1961. pp. 8-16
6. USDA PA-514, Soil, Crops, and Fallout from Nuclear Attack, 1962
7. USDA PA-516, Your Livestock Can Survive Fallout from Nuclear Attack, 1962. pp. 2-6

TRAINING AIDS:

None

A. Introduction

It has been mentioned previously that civil defense is a responsibility of Federal, State and local governments. Civil defense is also an individual responsibility. Just as planning for emergencies is taking place at all levels of government, such planning must also be done by individuals for the safety and protection of themselves and their families. In planning for emergencies there are certain things an individual must know, there are certain things a individual must have before disasters take place, and there are certain things that an individual must do when disasters take place. During this lesson we will discuss some of these factors with the goal of better equipping you to prepare a family survival plan for yourself and your family.

NOTE TO INSTRUCTOR:

This lesson lends itself more to group discussion than some of the previous ones. Plan and present this lesson to stimulate a maximum of class participation. A Guide to Family Survival Planning can be found in the Student Manual, Personal and Family Survival as an Appendix. This guide outlines the essentials that should be considered in the making of a family survival plan. This guide is not meant to be comprehensive, or to restrict discussion of specific local needs. Let students suggest the specifics, using as resource material the references listed.

No two family plans will be alike. Each plan should be tailored to meet the requirements of each family. As the essentials of a family survival plan are discussed, each student should be encouraged to pay particular attention to those elements that fit his particular situation. They should be encouraged to prepare a family plan following the presentation of this lesson.

The following is An Outline for Family Emergency Planning similar to the one in the student manual. Also to be found are suggestions and guidance which the instructor may wish to use in presenting this lesson.

AN OUTLINE FOR FAMILY EMERGENCY PLANNING

The nearest community fallout shelter to our home is located at
____.

By what methods may family members find out the nearest community shelter to their home?

The best route from our home to this shelter is ______________
____.

What factors should be considered in planning a route to shelter?

The location in our home that offers the greatest fallout protection is____.

1. What program has been established by the government to provide this information to home owners?
2. If you had to determine this area for yourself, what are some of the factors you would consider?

Our Emergency Broadcast System Station is____________________.
Its dial setting is____.

1. How can one find the Emergency Broadcast System Station (EBS) and its dial setting for his particular area?
2. What types of information will be broadcast over EBS?

NAMES OF FAMILY MEMBERS					
Nearest Shelter to Work/School					
Best route planned?					
Is assistance to shelter needed?					
Who will provide?					

1. Why is it necessary to know the location of shelters other than those nearest home?

2. What members of a family may require special assistance to shelter?

Civil Defense Training Completed:					
Personal and Family Survival					
Medical Self-Help					
Home Nursing					
First Aid					
Shelter Management					
Radiological Monitoring					
Firefighting					

1. What qualifications should individuals have to enroll in the civil defense courses mentioned on the outline?

2. Which members of a family should be encouraged to take what courses? Why?

3. How may one find out where and when the courses are given?

NAMES OF FAMILY MEMBERS					
Family responsibility for: Supplies to take to public shelter					
Home shelter area food					
Home shelter area water					
First Aid and First Aid Supplies					
Eliminating fire hazards and fire fighting					
Safe storage of vital family records					
Sanitation and sanitation supplies					
Maintenance of family shelter area					
Insure battery radio is available and working					

1. Who is the most logical family member to assign each of the responsibilities?

2. What special training or information is necessary to enable one to carry out the assigned responsibility?

3. What types of records should be safeguarded during an emergency?

4. What provisions might be made for safeguarding these records before an attack?

Special Personal Needs Serious allergies					
Special medicines					
Special foods					
Infant supplies					

1. What is the importance of knowing this personal data in times of emergencies?

2. What other types of information about family members might prove helpful?

Check List of Supplies for Family Shelter Area

_______________ Water

_______________ Food

_______________ Sanitation

_______________ First Aid and Medical

_______________ Battery Radio

_______________ Change of Clothing

_______________ Citizens Radiation Meter

_______________ Firefighting

NOTE TO INSTRUCTOR:

Review supplies that should be placed in a home shelter. Refer students to Chapter 5 in the Student Manual for a more complete list of home shelter supplies. The supplies listed in the Outline for Family Emergency Planning cover very broad categories and should be used only as a checklist. The Student Manual and other reference materials should be consulted for amounts and types of items.

Discuss the following:

1. What are some sources of water that may be found in the ordinary household and used during emergency periods?

2. If this water is not contaminated from fallout, what measures could be taken to assure that it is otherwise safe to drink?

3. If water is in short supply and has to be rationed, what priorities should be established for its use?

Items we plan to take to community shelter

NOTE TO INSTRUCTOR:
Using the list of home supplies as a reference, make a list of items that should be taken to a community shelter. This should be limited to survival essentials such as insulin or other items, because of limited space in shelter, time required to pick them up and problems of "to share or not to share."

____

____

____

____

If our family is separated we will reunite at ________________

____________________or if this location is not available at___

____

when we are able to come out of shelter.

1. At what types of places might a family plan to meet after a disaster?

2. Why should they plan for alternate locations?

We can obtain additional planning information from
Civil Defense Director___________Telephone___________
County Agricultural Agent_________Telephone___________
How might the names and telephone numbers of these individuals be obtained?

NOTE TO INSTRUCTOR:
The following checklist may be used as a guide in determining the effectiveness of family planning

I. Pre-Emergency Checklist

______ (1) Family members know actions to take on warning signals.

______ (2) Family members know family survival plan.

______ (3) Family members know how to turn off utilities.*

______ (4) Home fire hazards have been corrected and periodic checks have been scheduled.

______ (5) Family members know actions to be taken in case of fire.

______ (6) Family members know what actions to take if a nuclear flash occurs without previous warning.

______ (7) An Adequate supply of food and liquid is on hand.

______ (8) A battery-operated radio is available.

______ (9) Tests for this plan have been scheduled and appropriate revisions are being made.

Make a list on the chalkboard of the actions one should take should a nuclear flash appear without warning.

Review the following emergency actions.

(1) Listen to emergency information being broadcast on the Emergency Broadcasting System.

---

* NOTE TO INSTRUCTOR: Check with the local utility companies before raising this point. In many areas, it is better to leave utilities turned on.

(2) Warn all family members.

(3) If time allows:

  (a) Close doors, windows, and blinds.

  (b) Shut off gas and electricity if local companies recommend.

  (c) Fill containers with water.

  (d) Close water shut-off valve to trap water in home.

  (e) Dispose of highly combustible materials.

  (f) Prepare essential survival supplies for movement to shelter area.

  (g) Safeguard valuables.

(4) Gather essential supplies.

(5) Move to shelter.

(6) Follow instructions of your shelter manager.

LESSON PLAN NO. X

Emergence from Shelters

V-140

LESSON TITLE: Emergence from Shelters

OBJECTIVES:

1. To develop an understanding of what post-shelter conditions may be like and the precautionary and protective measures that should be taken.
2. To develop an awareness of National, State and local plans for community recovery and rehabilitation.

REFERENCE:

Personal and Family Survival, SM-3-11, (Revised)

TRAINING AIDS:

1. Visual set, Personal and Family Survival, Frames 140-149.
2. Projector and screen
3. Equipment for demonstration
    a. Low range Beta-Gamma Survey Meter (CD-V-700)
    b. Amplifier-speaker cord with jack
    c. Phosphorus 32
    d. Head of Lettuce, banana, can of juice
    e. Small plastic bag

A. Introduction

During the last lesson we discussed how families must plan and prepare in advance for shelter living. We were also made aware of the fact that shelter living will be tolerable but not enjoyable and those of us who have to undergo this experience will look with anticipation to the day that we are able to emerge from shelters. In this lesson we shall discuss emergence problems, safeguards, and precautions we must take upon emergence, and plans for restoring or rehabilitating our community should this be necessary.

B. The Decision to Leave

CAN WE GO?
SHELTER MANAGER
CD DIRECTOR

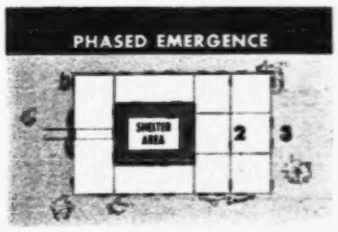
V-141

1. The decision to leave shelter on either a temporary or permanent basis will be made only after a great number of factors have been taken into consideration. This decision will usually be made by shelter managers upon the advice and with the concurrence of the local government officials such as the civil defense director or his representative. The general rule is the longer people remain in shelter, the less the danger of exposure to radiation. Factors to be considered include:

   a. Conditions in the shelter such as overcrowding, food, water, and medical supplies, and illness.
   b. Radiation dose to which shelterees have been exposed.
   c. Outside radiation levels.
   d. Availability of adequate and safe food, water, and lodging outside of shelter.

2. Because shelter managers may not have all of the information necessary, local government emergency operations centers will usually advise them about emerging from shelters either on a temporary or permanent basis.

C. Time Phasing of Shelter Departure



V-142

1. Probably, departure from the shelter will be neither "all at one time," nor on a permanent basis. Rather, it will probably start with a RADEF monitoring team going first into other parts of the building, and then outside. Later on when radiation levels permit, other types of teams, accompanied by a RADEF monitor, will go out on reconnaissance and for emergency supplies and equipment. Finally, occupants can probably leave the shelter on

a rotational basis for some periods of time.

2. It is possible that at the period of time when temporary emergence begins, the shelter will continue to be the main lodging for days or even weeks.

3. There is no way to predict pre-attack what the outside situation will be for a given shelter or community. Conditions may vary from shelter to shelter and from community to community.

D. Improving Shelter Living

IMPROVING
SHELTER
LIVING

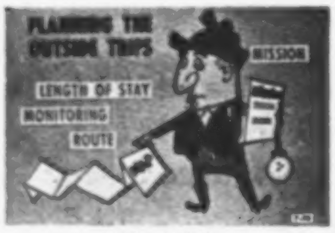
V-143

1. The desire to leave the shelter permanently can be greatly reduced by various improvisations to improve the general living conditions and short trips outside by teams to secure additional supplies and equipment.

2. In shelters which are a part of large buildings, shelter occupants can gradually move out on a rotational basis to areas in the buildings with less protection than the shelter area proper.

3. The amount of radiation received by each person should always be kept to a low level. This can be partially controlled by different people going out for different missions.

E. Planning Outside Trips



V-144

1. If a trip outside the shelter is necessary, careful planning should be done. The purpose of the trip must be clearly understood, and a plan should be developed so that missions can be accomplished in the shortest possible time.

2. RADEF monitors will take readings of the radiation level outside of the shelter. If the decision is made to send people out, RADEF monitors may accompany them to monitor the pathway traveled.

3. Team members must be told of and must not exceed the planned stay time outside the shelter.

4. Supplies and equipment brought back may be checked for contamination and decontaminated, if necessary, by dusting or washing. The same is true of the people who have been outside.

5. Records must be kept for each individual of the dose received and his total cumulative dose.

F. Extended Work Parties

1. Radioactivity decays rapidly at the beginning, but decreases progressively slower with time. This means that under certain circumstances it could be weeks before it would be safe to leave shelter permanently.

2. Following short exploratory trips and the emergency missions to obtain needed supplies, longer stays for work parties are in order. These work assignments or releases for self initiated work should be carefully controlled to preclude the accumulation of excessive radiation by individuals.

3. Eventually, the population in certain areas may be required to return to shelter for sleeping only.

G. Permanent Vacating of Shelter

1. The shelter would be closed permanently when the emergency operating center has determined it is no longer needed. The closing must be in keeping with the post-shelter emergency plans of the community.

2. This would take place when radiation has decreased to acceptable levels and when lodging is available for all shelterees either in their homes or elsewhere.

3. Before final closing, the shelter will be cleaned, all remaining supplies and equipment properly stored, and all wastes properly disposed of.

Shelters should be left ready for re-use, if it should become necessary.

H. Outside Conditions and Precautionary Measures

1. During shelter occupancy shelterees will be told about possible outside conditions and precautionary measures that should be taken when they leave shelter.

EMERGENCE PROBLEMS

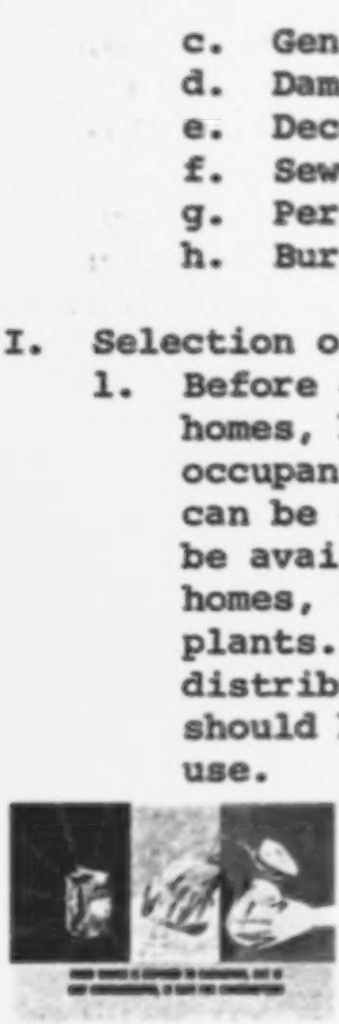
V-145

2. Major problems which may confront people and which will require understanding are: NOTE: Discuss the following with class and develop some solutions.

   a. External radiation level.
   b. Radiation contaminated premises.
   c. General debris.
   d. Damage to homes and property.
   e. Decaying matter--garbage, waste, animals.
   f. Sewage disposal.
   g. Personal hygiene and sanitation.
   h. Burial of the dead

I. Selection of Edible Foods

1. Before and during excursions by survivors to their homes, businesses, or on work details, the shelter occupants should understand how to select foods that can be eaten. Some Federal shelter supplies may still be available. however, the bulk of foods will be in homes, stores, wholesale outlets, and in processing plants. Most stored processed foods can be readily distributed. Bulk foods, especially those not processed should be carefully tested by authorized personnel before use.



V-146

2. Most foods stored indoors should be reasonably safe to eat. This includes canned goods, packaged, prepared, or unprepared foods and even the foods in bulk which have been protected. Perishable foods that are still edible should be consumed first. If animals have been sheltered and have been given only stored foods and uncontaminated water, the meat and poultry and dairy products can be consumed without danger.

3. Animals exposed to radiation can be slaughtered and eaten as long as they exhibit no symptoms of radiation sickness. An unhealthy animal would not be a suitable source of food. The re-establishment of local, State

and Federal inspections will help to establish the usability of meat supplies. Some meats not meeting human consumption standards could be used for other purposes such as animal feed and fertilizer.

4. The method of salvaging contaminated or damaged food is to segregate the contaminated from the uncontaminated and to clean up the former, if possible. Often the radioactive contamination or damage will be located only on the surface of bulk food. By careful removal of this contamination the remaining food is safe for consumption. Meat can be trimmed. Fruits and vegetables can be washed and peeled or their outer leaves removed. The dusting or washing of other foods with a detergent solution will remove much of the contamination. Certain produce can be peeled to remove contamination.

5. The shelterees should be advised that food products stored in undamaged refrigerators or freezers will not be contaminated. Even though there may have been a breakdown of refrigeration, some perishable products might be salvaged if the bacterial damage has not been to great.

6. Sterile canned products have greater salvage potential than other types of foods. Radioactive contamination can be removed from the surface of cans by a relatively simple washing process.

7. Demonstrate the cleansing of fruits and vegetables.
   Part I
   a. Monitor a head of lettuce (or cabbage) and a banana to show absence of radioactive contamination.
   b. Place items in a plastic bag.
   c. Place a drop or two of P^{32} (phosphorus 32) solution to simulate fallout contamination on the outside of the plastic bag.*
   d. Using the probe of the low-range beta-gamma survey meter (CD-V-700) monitor the bag on the outside and on the inside. This demonstrates that the lettuce

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* The CDAE Staff of your State Department of Education will give you information on procurement of P^{32}

and banana are exposed to the radiation. Be careful not to let the probe become contaminated while you are monitoring the outside of the bag. The probe can be protected from contamination by placing it in a plastic bag and securing the bag with a rubber band.

e. Remove the lettuce and the banana from the bag and monitor them. If this is correctly done, there should be no contamination.

Part II

a. Place a drop of P^{32} solution on a banana to contaminate it.
b. Monitor the banana to show the presence of contamination.
c. Peel the banana carefully.
d. Confirm the absence of radioactive contamination on the peeled banana with the survey meter.
e. Eat the banana.

J. Obtaining Potable Water

WATER IN CLOSED OR COVERED CONTAINERS WILL BE SAFE

V-147

During excursions by shelter occupants and inspection teams the water supplies must be checked and controlled. Some water sources may be contaminated by germs as well as fallout. First, a determination must be made on the available sources of water and, then its potability established. Some water will be safe for drinking and some sources will be suitable for other uses.

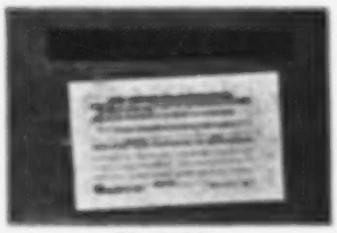
1. As communities are rehabilitated, people must listen carefully to health officials or to local authorities for instructions on home water purification. The water utilities within the local area must reactivate their water systems, their pumping and filter plants, and test the water regularly.

2. During the shelter stay shelter occupants will learn that radiation does not affect water. It is only when fallout particles get into the water that radiation may become a hazard. Water can be decontaminated by removing the particles. This will be accomplished at normal water filtration plants as soon as they are in operation.

3. There are many ways to rid water of germs; e.g. adding water purification tablets, boiling vigorously for a few minutes, adding 20 drops of iodine to a gallon of clear water or 40 drops when the water is cloudy, and using liquid household bleach of the sodium hypochlorite type in accordance with the instructions on the container.

4. It may be necessary to regulate the consumption of water.

K. Survivor Registration



V-148

1. As the general situation permits, survivor registration will take place and information will be made available concerning whereabouts of individuals. Among the forms that may be filled out during registration is this Post Office Emergency Change of Address and Safety Notification Form. This form will help people to locate loved ones and friends in other areas by mail.

L. Feeding, Clothing, and Housing

1. Welfare centers will be established to provide assistance in securing food, clothing, and housing.

2. It is very likely that many shelters will serve as welfare centers.

M. Restoration of Public Utilities and Essential Services

1. Communities that are well organized to meet emergencies will recover more quickly.

2. Damage to transportation systems and roadways or the presence of temporarily hazardous radiation areas, may isolate communities. Therefore, each community should plan to be self-reliant for a period of time.

N. Personal Hygiene and Sanitation, Decaying Matter, Sewage Disposal.

During the time people are in shelters, normal community services will likely have been interrupted, causing sanitation problems. It is likely that disease-causing germs and bacteria, insects, and rodents will be present. The body may be somewhat less resistant to germs because of weakened physical condition. The following actions should be taken:

a. Remove and bury waste, dead animals, and garbage.
b. Disinfect certain areas and premises.
c. If normal toilet facilities are not available, be certain that human wastes are properly covered or buried.
d. Spray or poison insects and rodents.
e. Observe good personal hygiene practices, such as washing thoroughly with hot soap and water, disposing of human wastes, using disinfectants, and eating a balanced diet.

O. Damage to Homes and Property and General Debris

Homes and debris may be covered with radioactive materials. Remove debris as required and restore home as quickly as possible. Approved methods to prevent becoming personally contaminated should be used. Ordinary clothing is worn. It should be given a quick brushoff with the hands when leaving a contaminated area if any contamination is visible.

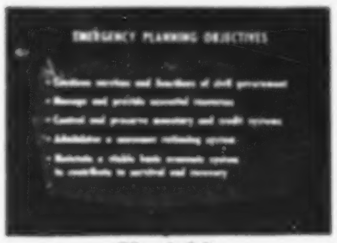
P. Office of Emergency Planning

1. The Office of Emergency Planning came into being September 22, 1961, as a successor to the Office of Civil and Defense Mobilization, to advise and assist the President in the total nonmilitary defense program of the United States. It is a staff arm of the President, as distinguished from the Office of Civil Defense, which is an operational arm of the Department of the Army.

2. The Office of Emergency Planning has developed a "Comprehensive Program for Survival of Government and Management of Resources" which is now being extended to the State and local level. It is based on a concept

of (a) the primacy of the war powers of the Federal Government, and (b) a need for working partnership between Government and community leaders at all levels to achieve national preparedness.

3. In the event of nuclear attack, the people would look to government, not only to maintain law and order but to conserve and use surviving resources wisely. This will require immediate action at the State level on problems heretofore solved by the Federal Government. In taking such action, State and local governments will carry out Federal as well as State laws to achieve national objectives. In such cases, Federal direction and control will be reestablished as soon as possible.



EMERGENCY PLANNING OBJECTIVES

V-149

Emergency Planning objectives include capability to -

a. Continue the services and functions of civil government.
b. Manage and provide essential resources including food, fuel, power, transportation, and communications.
c. Control and preserve monetary and credit systems until Federal control can be reestablished.
d. Administer a consumer rationing system and other measures for the distribution of essential items for consumers.
e. Maintain a viable basic economic system to contribute to survival and recovery.

4. The Office of Emergency Planning is supporting, by contracts with State governments, emergency planning work at State level to accomplish these objectives.

Q. Community, State, and National Recovery

1. Communities, States, and the Nation can and will survive and recover from attacks upon this country.

2. Many communities and States have mutual aid plans. Areas which are undamaged or lightly damaged will provide personnel, supplies, and equipment to areas which

have been more heavily damaged.

3. The Federal Government has stockpiled millions of dollars worth of foods, tools, critical raw materials, supplies, equipment, and emergency hospitals at strategic locations throughout the country.

4. Manufacturers, builders, bankers, industrial officials and labor leaders working with appropriate agencies of Government will work together to restore the nation to a normal condition.

R. Specific Briefing on Conditions Outside the Shelter

1. Much of the information concerning post-shelter conditions has been somewhat general. It is difficult to know and predict the details of what post-shelter conditions will be like. Also, they will vary from community to community.

2. The shelter manager at some time before emergence from shelter will have more specific information on conditions outside the shelter. He should provide instructions and information to his staff and shelter occupants concerning:

   a. General conditions in the area in terms of fire, blast, and radiation.
   b. Plans for temporary and permanent emergence from shelter.
   c. Availability of food, water, clothing, and lodging.
   d. Community planning for providing supplies and equipment necessary for personal survival, restoration of utilities, essential services and rehabilitation.
   e. State and National situations.

APPENDIX A

Suggested Outline for Presentation of Local Civil Defense

Some local Civil Defense Directors will already have ideas about how they wish to present this topic and may not wish to use this outline. Others may desire some guidance for the organization of their presentations. Still others will not be able to present the subject personally but will be able to provide essential information to the instructor.

This outline may be used by those desiring some help in preparing a presentation. The outline should not be considered to be restrictive--it is suggestive only. The local Civil Defense Director is free to modify it in any way he sees fit for either his own presentation or for presentation by the instructor. The instructor should be guided by the desires of the local Civil Defense Director. Non-applicable items should, of course, be omitted.

I. History and staffing of local civil defense

   A. How it was started. Include any legal actions, official appointments, etc.
   B. What is the present staffing of the civil defense organization--a single volunteer, a well-rounded staff with specific assignments, or what?
   C. Central physical facilities--where located, how adequately housed, etc.
   D. Who plans the local civil defense program--the Director, the staff, the Mayor's Council, or whom?

II. Shelters

   (Discuss each of the following topics in terms of total requirements, status to date, and expected accomplishments for the next year.)

   A. Shelter facilities licensed
   B. Shelter facilities marked
   C. Shelter facilities stocked
   D. Shelter managers assigned and trained
   E. Shelter radef monitors assigned and trained

III. Emergency Readiness and Control

(Discuss each of the following topics in terms of total requirements, status to date, and expected accomplishments for the next year.)

A. Daily hours coverage of local warning point
B. Fixed radef monitoring stations
C. Radef kits operational
D. Emergency Operating Center Facility
E. EOC communications lines
F. EOC executive group organized and trained
G. EOC radef officers assigned and trained
H. EOC operations staff assigned and trained
I. EOC communications staff assigned and trained
J. Other EOC staff assigned and trained

IV. Emergency Services

(Discuss the status of operational plans for utilizing the following emergency services.)

A. Police
B. Firemen
C. Rescue personnel
D. Doctors, dentists, and other medical personnel
E. Welfare services
F. Transportation

V. Community Shelter Planning

(This subject is recommended in communities in which CSP is underway or in which it is anticipated that it will start in the near future.)

A. Step I--Current shelter capability allocation plan
B. Step II--Emergency information readiness
C. Step III--Identification of shelter deficits
D. Step IV--Procedures for development of shelter
E. Step V--Directives for updating local civil defense emergency plans
F. Step VI--Official adoption or approval of Community Shelter Plan

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